grade control and accommodate over bank flows, therefore, hydrologic function of any wetlands/waters of the U.S. should be improved by these measures and the impacts would not be considered significant.

Placement of boulders and logs in the stream channel in Reaches 2, 3, 4, 5, and 6 can be considered fill in waters of the U.S., however the purpose of installing these measures is to improve bank stability and aquatic habitat. Re-vegetation of the in-channel enhancements will further improve these wetland functional values. No significant adverse impact to wetlands will result from these measures.

Local drainage patterns will be altered by implementation of Alternative 3. Improvement of hydrologic functions is expected to retain water in project site wetlands longer. Runoff from storm events will be temporarily stored and released downstream more slowly. Flooding hazards will be reduced outside the project area. This is considered a positive impact.

Overall, the long-term impacts of Alternative 3 on wetlands in the project area would be positive. Downstream wetlands and waters of the U.S. would also benefit from reduced erosion and enhanced water quality improvement functions of the project area wetlands.

III.C.4.2 Unavoidable Adverse Impacts

Some short-term adverse impacts related to water quality and habitat functional values are possible during the construction phase and until vegetation is successfully established on disturbed areas. These impacts are substantially the same for both Alternatives 2 and 3.

Soil will be disturbed and vegetation removed during construction, which could result in increased erosion, turbidity and sedimentation in wetlands and waters of the U.S. in the area of influence. Equipment and vehicles used during construction could accidentally introduce pollutants into wetlands and waters of the U.S. in the project area. Demolition of the existing bridge and ford crossing and construction of replacement bridges could accidentally introduce debris and pollutants into wetlands and waters of the U.S. as well.

Construction activities will involve clearing existing vegetation, grading, placing fill, excavating soil, demolishing structures, and building bridges in and adjacent to flowing water and within the floodplain of the Upper Truckee River. The disturbed areas will be vulnerable to water erosion and/or entrainment of debris or contaminants in storm runoff until site clean up and re-vegetation are complete. Large runoff events that occur in the first several years after construction before vegetation is well established could also increase erosion and sedimentation in the area of influence.

Accidental leaks and spills of chemicals, concrete leachate, or petroleum-based products such as hydraulic fluids, diesel fuel, and oil during construction could contaminate surface water and harm aquatic life and associated biological resources.

Accidental release of demolition debris to the Upper Truckee River may occur when existing structures are removed. Construction of the replacement bridges could also introduce contaminants into or increase turbidity in the river or adjacent wetlands.

Habitat functional values will be disturbed during the construction phase. Some habitat elements, such as willows and lodge pole pines, will be removed. Replacement trees, especially pines, will take a long time to grow back. These trees may provide cover, nesting, rearing, resting, and feeding functions for birds and mammals. Some deeper depressional areas within existing wetlands in the project area could be filled in. These depressions may provide breeding, rearing, and feeding functional values for amphibians.

III.C.4.3 Proposed Mitigation

To address potential adverse impacts to the water quality functional values of wetlands in the area of influence the following mitigation measures are recommended:

1. Construction activities should be avoided during the wet season (approximately October – May) to the extent possible. If construction must take place during this time, upstream flows should be continuously monitored in real-time to assure that equipment, vehicles, supplies, and personnel are not caught in the floodplain during over bank flow events.

2. Storage of equipment, vehicles, and construction materials, including soil fill material in the project area should only take place during the dry season (May – October).

3. Erosion control measures such as small catch basins, filter fabrics, straw bale or coir log barriers that prevent soil and sediment from leaving the project site shall be installed, monitored and maintained during construction activities.

4. Vehicle and equipment washing, refueling, and maintenance activities should not occur in meadow and floodplain portions of the project area.

5. Vehicles and equipment operated within the project area should be checked and maintained daily to prevent leaks of fuels, lubricants, or other fluids into wetlands or waters of the U.S.

6. To the extent practicable, desirable vegetation removed during excavation activities should be salvaged for re-vegetation of the disturbed areas.

7. Re-vegetation of disturbed and graded areas should occur prior to the onset of the first rainy season following construction. Temporary erosion protection, such as the use of erosion control blankets, shall be used on any areas that cannot be re-vegetated prior to the onset of the rainy season.

8. Re-vegetation of bank and overflow areas shall incorporate additional erosion protection measures, such as erosion control fabric, into the design. This will provide additional protection from erosion during the vegetation establishment period. These areas shall be monitored at least annually and after major runoff events. Repairs shall be made as necessary until the vegetation is well established.

9. Quality of water leaving the project area shall be monitored before, during, and after construction of the project to determine significant impacts.

10. Any de-watering or drilling fluids created during construction shall be directed to a sedimentation tank/holding facility that allows only clean water to return to the Upper Truckee River. Disposal of settled solids shall occur at an appropriate offsite location.

11. A plan shall be prepared and implemented to prevent demolition and bridge construction debris from entering the Upper Truckee River. Debris includes raw cement, concrete, metal, asphalt, paint or other coating material, oil or other petroleum products, or any other substance that could be harmful to aquatic life. The plan should include steps to be taken in the event of an accidental release of debris, including clean-up measures to protect water quality and aquatic habitat.

To address potential adverse impacts to the habitat functional values of wetlands in the area of influence the following mitigation measures are recommended:

1. Construction activities should occur outside the primary breeding period (May 15 -August 15) to the extent possible.

2. Removal of snags and downed logs should be avoided where possible. Where they cannot be avoided they should be relocated within the project area.

3. Retain some existing trees and shrubs in small clumps during fill removal and other excavation activities to provide interim habitat functions and seed sources for re-vegetation.

4. Depressional areas that provide amphibian habitat should be avoided where possible. Any that must be filled shall have replacement depressions created within the meadow/floodplain area.

Implementation of these mitigation measures should reduce short-term adverse impacts on wetland functional values to a level of insignificance.

III.C.5 References

Bailey, Robert G. 1974. Land Capability Classification of the Lake Tahoe Basin, California-Nevada. USDA-Forest Service, South Lake Tahoe, CA.

Carter, Shelly. 2002. US Army Corp of Engineers, Sacramento District. Regulatory Specialist for the Tahoe Basin. Personal communication.

Carter, Virginia. 1997. "Wetland Hydrology, Water Quality, and Associated Functions" *in* National Water Summary on Wetland Resources. US Geological Survey Water Supply Paper 2425. http://water.usgs.gov/nwsum/WSP2425/functions.html Accessed July 18, 2002.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. US Department of the Interior, Fish and Wildlife Service, Washington, D.C.

Gibson & Skordal, Wetland Consultants. 1995. Delineation of Waters of the United States, Upper Truckee River and Wetlands Restoration Project. Global Environmental, Sacramento, CA.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. US Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS

Novitski, R.P., R.D. Smith, and J.D. Fretwell. 1997. "Wetland Functions, Values, and Assessment" *in* National Water Summary on Wetland Resources. US Geological Survey Water Supply Paper 2425. http://water.usgs.gov/nwsum/WSP2425/functions.html Accessed July 18, 2002.

Rogers, John H. 1974. Soil Survey, Tahoe Basin Area, California and Nevada. US Department of Agriculture, Soil Conservation Service and Forest Service, Washington, D.C.

Sheldon, Wayne. 2002. USDA-NRCS Soil Scientist. Personal communication.

Swanson Hydrology & Geomorphology. 2002. Upper Truckee River Alternatives Description (draft). Swanson Hydrology & Geomorphology, Santa Cruz, CA.

Swanson, Mitch. 2002. Swanson Hydrology and Geomorphology. Personal communication.

US Army Corps of Engineers. 2000. Ecosystem Restoration Report and Environmental Assessment, Upper Truckee River, partial administrative draft. Sacramento, CA.

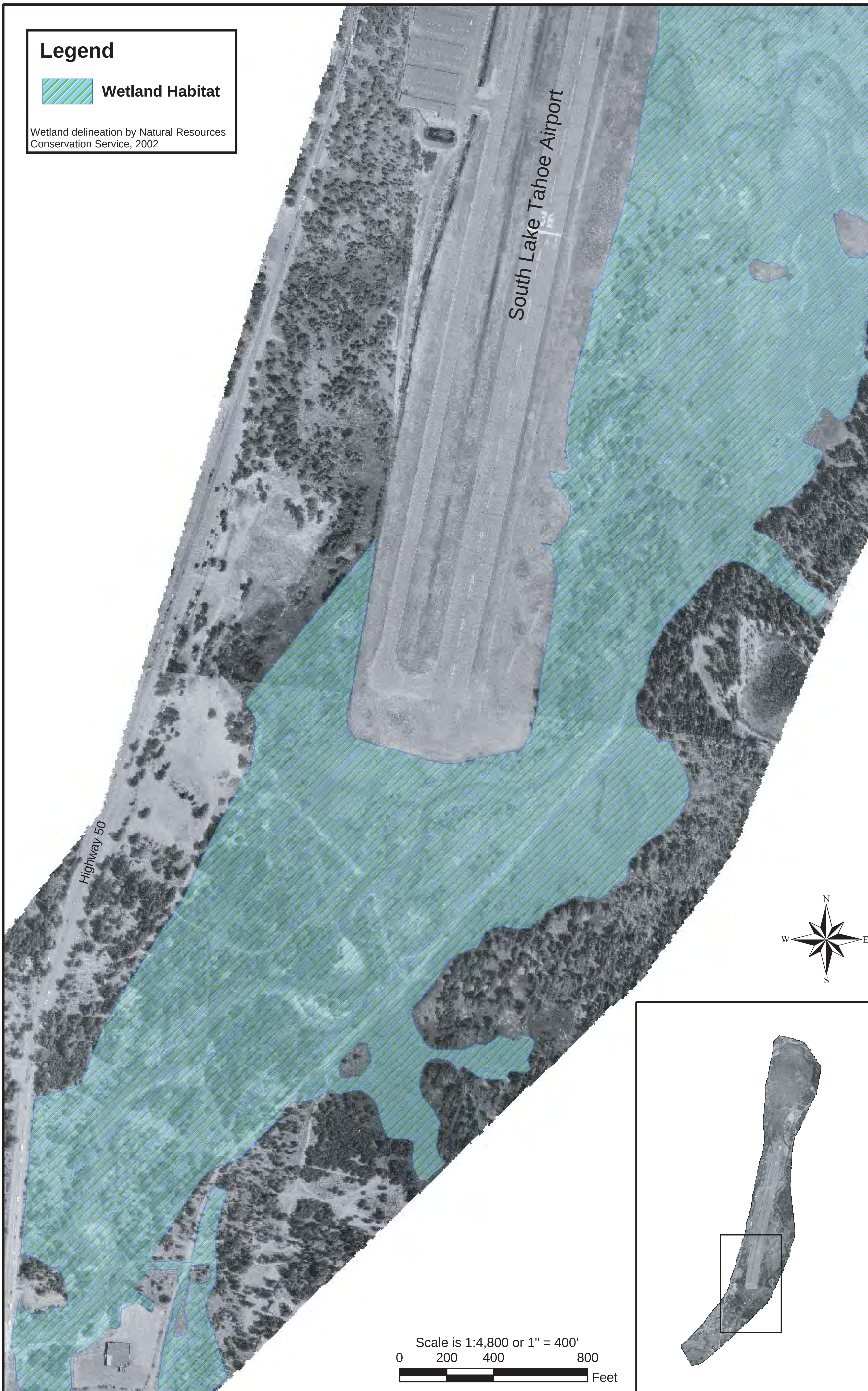
US Department of Agriculture, Natural Resources Conservation Service. 1997.

Hydrology Tools for Wetland Determination, Chapter 19, Engineering Field Handbook. Donald E. Woodward (ed.). USDA, NRCS, Fort Worth, TX.

US Department of Agriculture, Natural Resources Conservation Service. 1998. Field Indicators of Hydric Soils in the United States, revision 4.0. G.W. Hurt, P.M. Whited, and R.F. Pringle (eds.). USDA, NRCS, Fort Worth, TX.

US Department of Agriculture, Natural Resources Conservation Service. 1999. Climate Information for Placer County in the State of California. National Water and Climate Center, Portland, OR. ftp://ftp.wcc.nrcs.usda.gov/support/climate/wetlands/ca/06061.txt Accessed July 24, 2002.

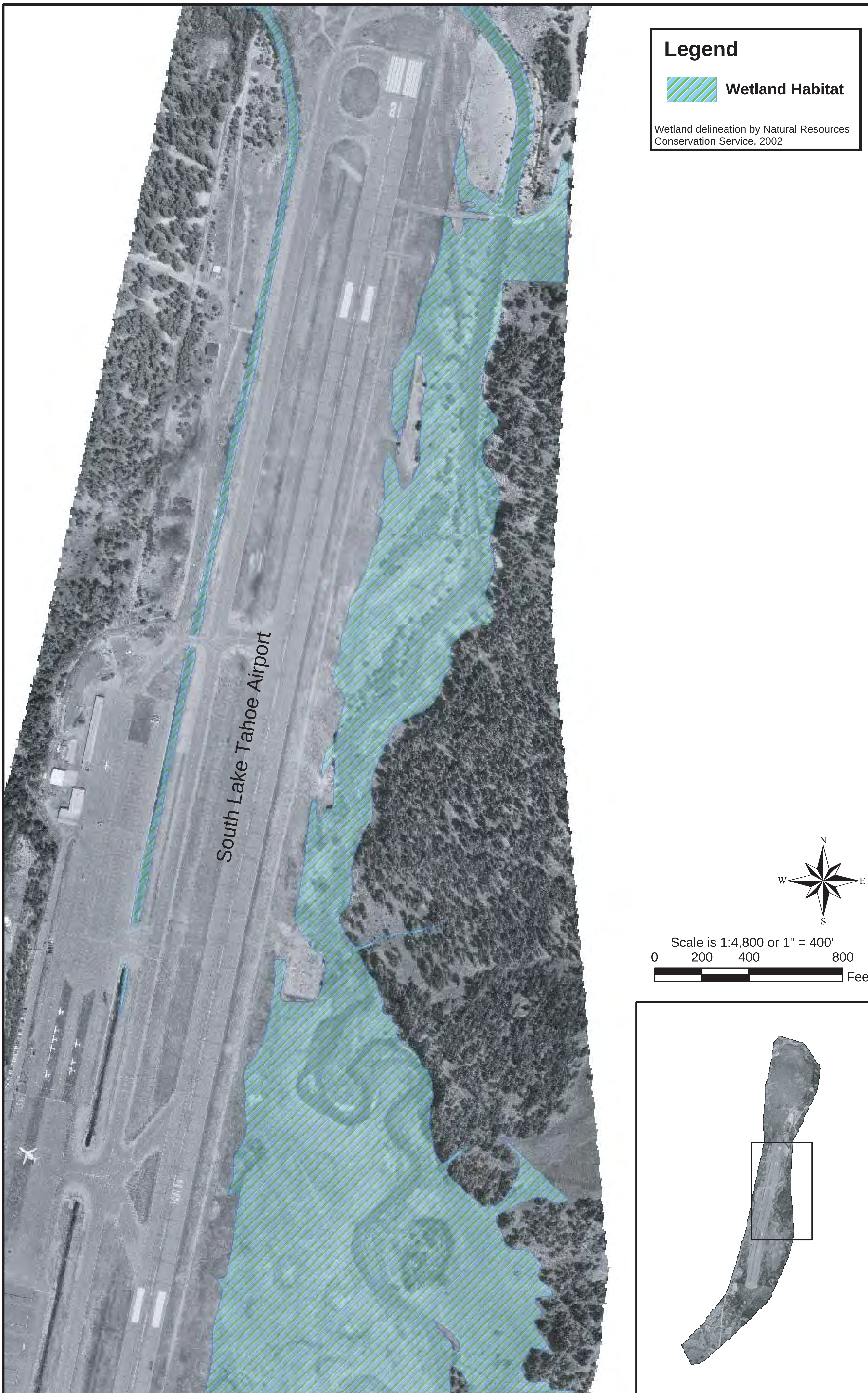
US Department of Agriculture, Natural Resources Conservation Service. 2000. National Food Security Act Manual, Third Edition, Amendment 5. USDA, NRCS, Washington, D.C.



Swanson Hydrology & Geomorphology
115 Limekiln Street, Santa Cruz, CA 95060
Tel: 831-427-0288 Fax: 831-427-0472

Upper Truckee River - Wetland Habitat

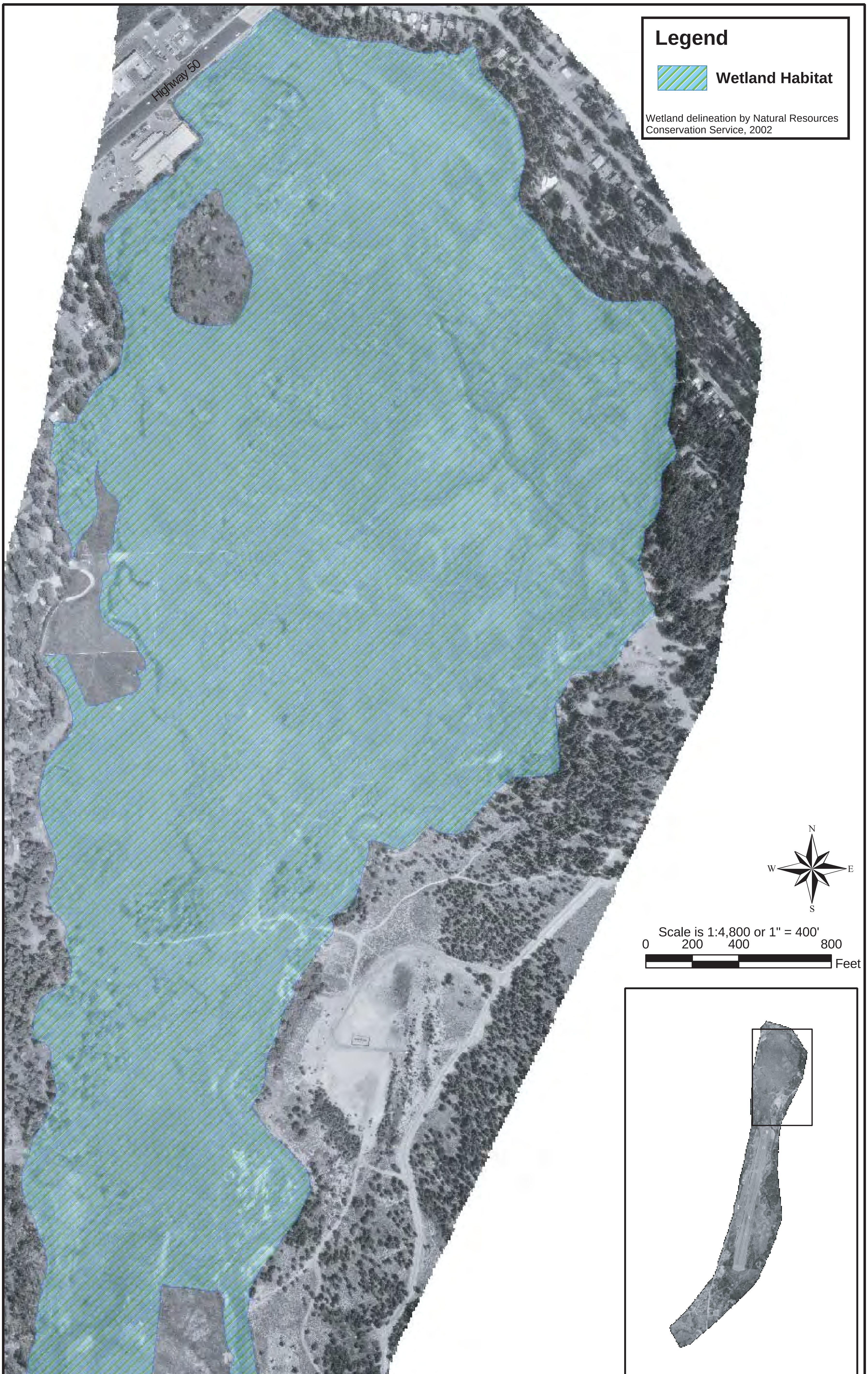
Figure III.C.1-A



Swanson Hydrology & Geomorphology
115 Limekiln Street, Santa Cruz, CA 95060
Tel: 831-427-0288 Fax: 831-427-0472

Upper Truckee River - Wetland Habitat

Figure III.C.1-B



Swanson Hydrology & Geomorphology
115 Limekiln Street, Santa Cruz, CA 95060
Tel: 831-427-0288 Fax: 831-427-0472

Upper Truckee River - Wetland Habitat

Figure III.C.1-C

III.D VEGETATION RESOURCES

III.D.1 Issues

The Upper Truckee River Watershed has been identified by the Tahoe Regional Planning Agency (TRPA) as an environmental restoration priority. The proposed project area has been significantly disturbed by human activities. The river and surrounding meadow were altered to increase the area available for livestock grazing and allow for the construction of the Lake Tahoe Airport. These changes and the subsequent grazing and commercial use have degraded both upland and riparian plant communities.

Most of the vegetation communities are in poor condition and there is a minimal level of regeneration along the riverbank and through out the meadows. The flooding and over bank flows into the meadows are infrequent because of the existing channelization of the river.

III.D.2 Analysis Methods and Assumptions

III.D.2.1 Impact Analysis Methods

Analysis of impacts to vegetation requires a survey and understanding of the existing vegetation communities. For the project both short-term impacts due to construction and long-term impacts due to the completed restoration were considered.

The existing vegetation was reviewed through extensive vegetation surveys in 2002. Both before and after the project alternatives had been proposed and reviewed. The species located on the site can be seen in Table III.D.1.

III.D.2.2 Assumptions

Impacts to the vegetation resources can be considered significant, less-than significant or no impact. The following assumptions assisted in the analysis of the impacts.

- Construction at the site would occur over the course of approximately six months.
- Approved vegetation species and planting methods will be completed after construction and will consist of methods that will prevent the infestation of weeds.
- Construction equipment that will potentially be used is; backhoes, loaders, scrapers, compactors, excavators, dump trucks, and water trucks.
- Area of construction influence will be minimized to areas within the project site that have been determined to need reclamation. No unnecessary travel or disturbance to the site will occur.
- The grazing of the disturbed locations will not occur until the revegetation is well established.

Table III.D.1 List of plant species encountered within the project site.

Scientific Name	Common Name
Achillea millefolium	Yarrow
Anaphalis margaritacea	Pearly Everlasting
Arnica chamissonis	Arnica
Artemisia ludoviciana	Silver Wormwood
Artemisia tridentata	Vassey Sagebrush
Aster occidentalis	Aster
Calyptridium umbellatum	Pussypaws
Carex aquatilis	Water Sedge
Carex athrostachya	Slender-Beak Sedge
Carex nebrascensis	Nebraska Sedge
Carex utriculata	Beaked Sedge
Ceanothus prostratus	Mahala Mat
Cirsium arvense	Canada Thistle
Collinsia parviflora	Blue Eyed Mary
Collinsia torreyi	Collinsia
Deschampsia	Hairgrass
Elymus trachycaulus	Slender Wheatgrass
Epilobium angustifolium	Fireweed
Epilobium glaberrimum	Willow Herb
Fragaria virginiana	Wild Strawberry
Geum macrophyllum	Big-leaved avens
Geum macrophyllum	Big-leaved Geum
Gilia leptalea	Blue Gilia
Glyceria elata	Mannagrass
Gnaphalium palustre	Cudweed
Heracieum lanatum	Cow Parsnip
Hoary cress	Whitetop
Hordeum brachyantherum	Squirrel-Tail Barley
Hypericum formosum	St. Johnswort
Juncus balticus	Baltic Rush
Juncus bufonius	Toad Rush
Lepidium densiflorum	Peppergrass
Leymus triticoides	Creeping Wildrye
Limosella aequalis	Mugwort
Linum lewisii	Blue Flax
Lotus corniculatus	Birdsfoot Trefoil
Lupinus lepidus	Dwarf Lupine
Lupinus polyphyllus	Tahoe Lupine
Luzula spicata	Spike Woodrush
Madia glomerata	Tarweed
Melilotus alba	White Blossom Sweetclover
Mentha arvensis	Mint
Mimulus guttatus	Monkeyflower
Muhlenbergia richardsonis	Mat Muhly
Penstemon rydbergii	Penstemon
Phalaris arundinacea	Reed Canarygrass

Table III.D.1. Continued

Scientific Name	Common Name
Phleum alpinum	Alpine Timothy
Phleum pratense	Timothy
Pinus contorta ssp. Murrayana	Lodgepole Pine
Pinus jeffreyi	Jeffrey pine
Plantago major	Common Plantain
Poa palustris	Fowl bluegrass
Poa pratensis	Kentucky Bluegrass
Polemonium occidentale	Jacobs Ladder
Polygonum arenastrum	Common Knotweed
Potentilla gracilis	Cinquefoil
Purshia tridentata	Bitterbrush
Ribes cereum	Wax Currant
Ribes lacustre	Swamp Currant
Rorippa curvisiliqua	Cress
Rumex acetosell	Sheep Sorrel
Rumex crispus	Curly Dock
Sagina saginoides	Pearlwort
Salix exigua	Coyote Willow
Salix geyeriana	Geyer's Willow
Salix lemmonii	Lemmon Willow
Scirpus microcarpus	Small Fruit Bulrush
Sidalcea oregana	Checker Mallow
Sisymbrium altissimum	Tumble Mustard
Sisyrinchium idahoense	Blue-Eyed Grass
Smilacina stellata	False Solomon's Seal
Solidago Canadensis	Canada Goldenrod
Symphoricarpos rotundifolius	Snowberry
Taraxacum officinale	Dandelion
Thalictrum fendleri	Meadow Rue
Trifolim longipes	Long-Stemmed Clover
Trifolium pratense	Red Clover
Trifolium repens	White Dutch Clover
Verbascum thapsus	Mullein
Wyethia mollis	Mules Ear

III.D.2.3 Cumulative Actions Considered

Two projects within and surrounding the project site are currently in consideration. They are (1) the Meyers to South Lake Tahoe Bike Path being planned for the east side of the project area. (2) A California Tahoe Conservancy (CTC) recreation plan for the previous Sunset Ranch property. In addition, the CTC reclamation project recently completed downstream of this project should be considered in respect to sediment transportation and its potential as an additional source of weedy and recruited vegetation species. It is probable that construction of the middle reach restoration may increase sediment transport, in the short term, to the recently completed project downstream of the lower

Highway 50 bridge. In addition, the project that has recently been completed downstream of Highway 50 may also contribute a natural source of species recruitment to this project once the earth is disturbed. The positive or negative aspect of this depends on the development and management of the recently completed downstream section for weedy and invasive species.

III.D.3 Affected Environment

III.D.3.1 Area of Influence

The project area would substantially be impacted throughout the riparian (stream environment zone), floodplain and meadow area. The riparian areas downstream of the project site would also be influenced. However the upland forest and scrub-shrub would not be influenced.

III.D.3.2 Existing Conditions

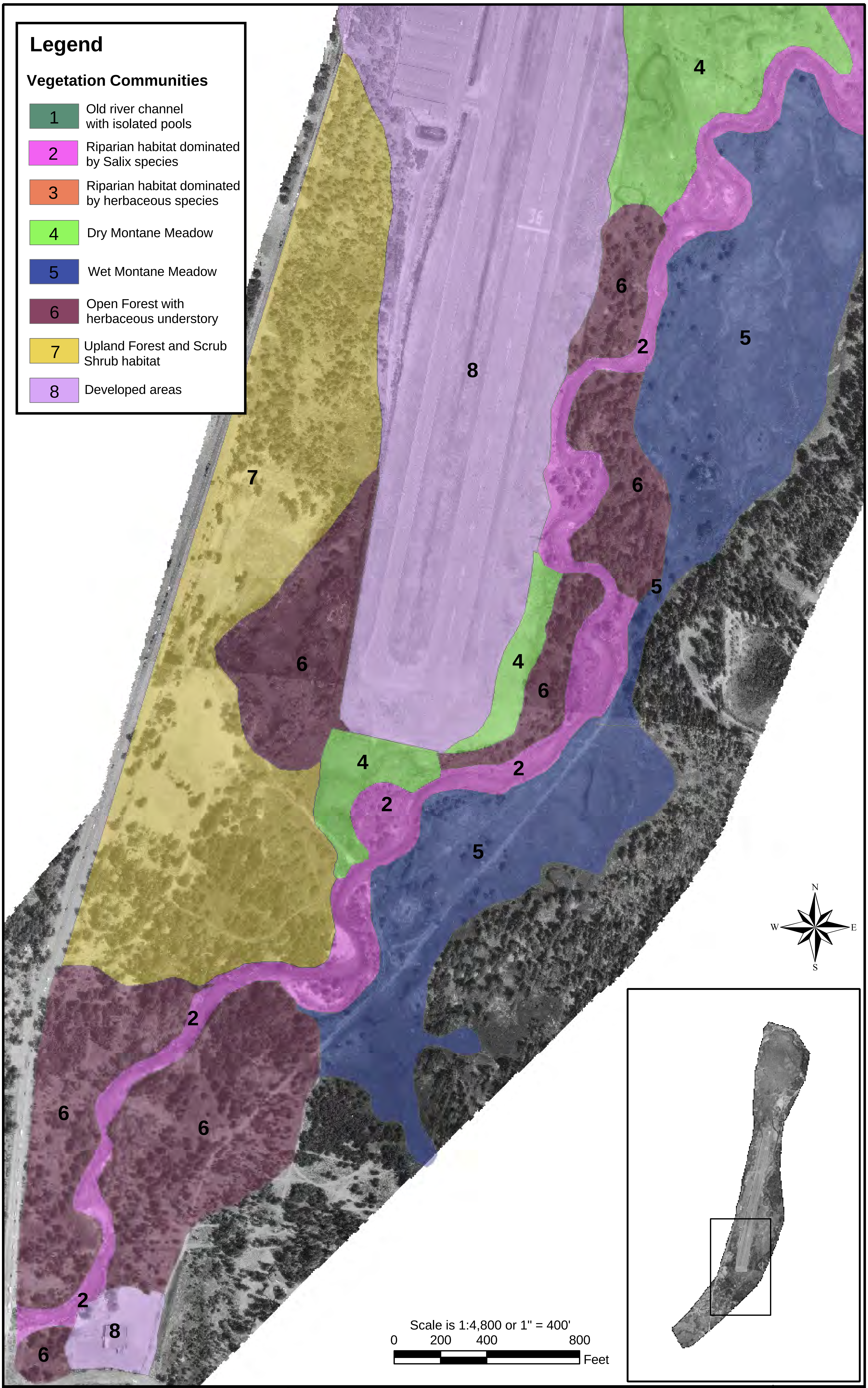
III.D.3.2.1 Description of Vegetation types

The plant communities were defined as follows (Figures III.D.1-A,B,C):

- Old channel with isolated pools,
- Riparian habitat dominated by Salix species,
- Riparian habitat dominated by herbaceous vegetation,
- Dry montane meadow,
- Wet montane meadow,
- Open forest with herbaceous vegetation under story and
- Upland forest and scrub-shrub habitat.

Perennial grasses, rushes and sedges dominate the meadow cover. *Juncus balticus* (Baltic rush) was the dominant herbaceous species. The perennial forbs were inter mixed and co-dominate within the meadows. *Trifolim longipes* (Long stemmed clover), *Taraxacum officinale* (Dandelion), *Arnica chamissonis* (Arnica), *Achillea millefolium* (Yarrow), *Phalaris arundinacea* (Reed canary grass) and *Wyethia mollis* (Mountain mules ear) were frequently observed. The cover appeared to be doing well considering the current level of use, poor soil nutrients, high elevation and other climate conditions. Several areas throughout the site (Reach 1, 3,4 and 6) show particular signs of drought. The plant cover, plant vigor and rejuvenation appear to be suffering from drought. In addition, the areas suffering also have a greater amount of litter. This could be a result of reduced moisture in those areas, a difference in their dominant species and their management.

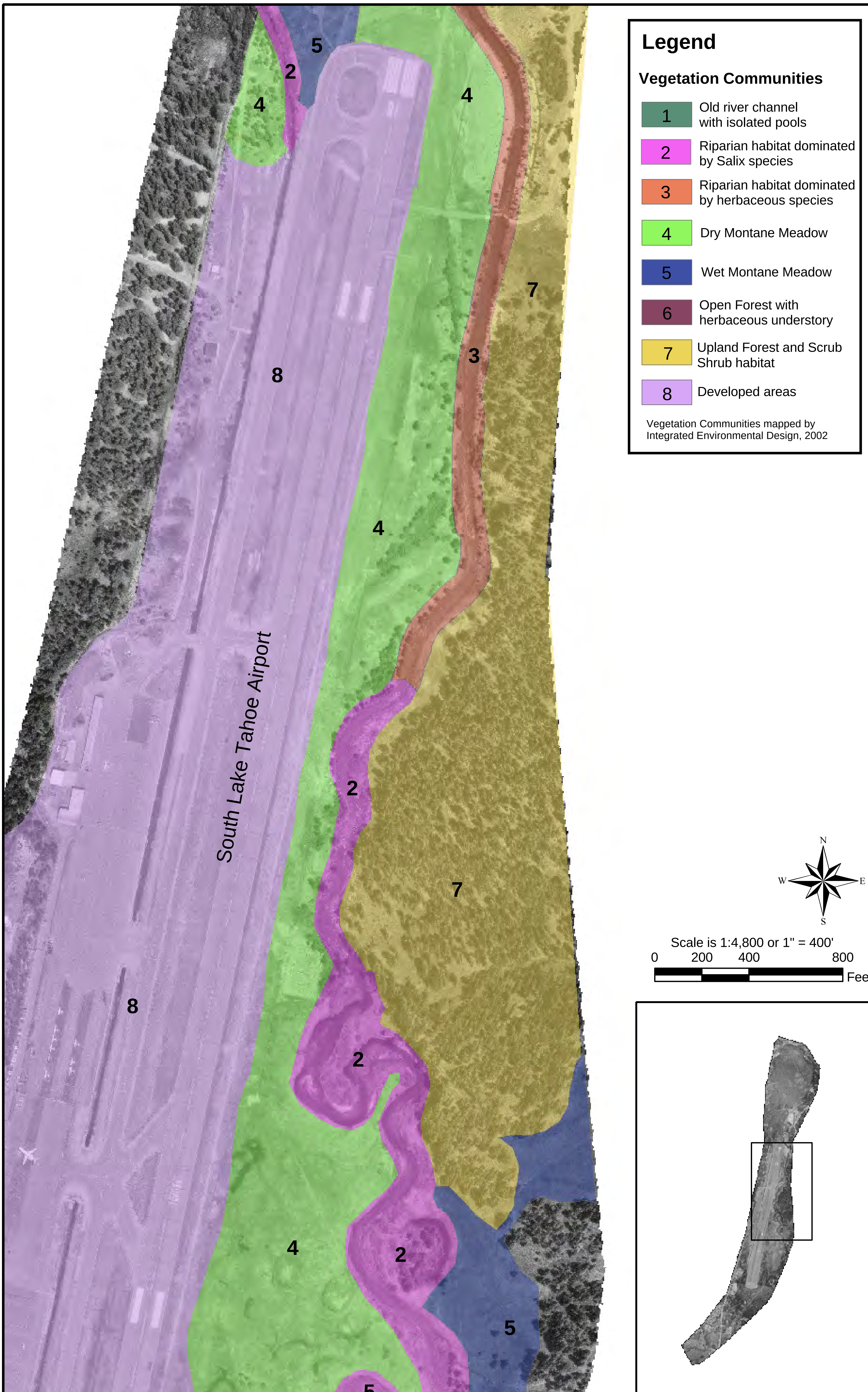
The dominant herbaceous species on the site represent a plant community indicative of a disturbed high alpine meadow. *Trifolim longipes (*Long stemmed Clover) grows best in



Swanson Hydrology & Geomorphology
115 Limekiln Street, Santa Cruz, CA 95060
Tel: 831-427-0288 Fax: 831-427-0472

Upper Truckee River - Vegetation Communities

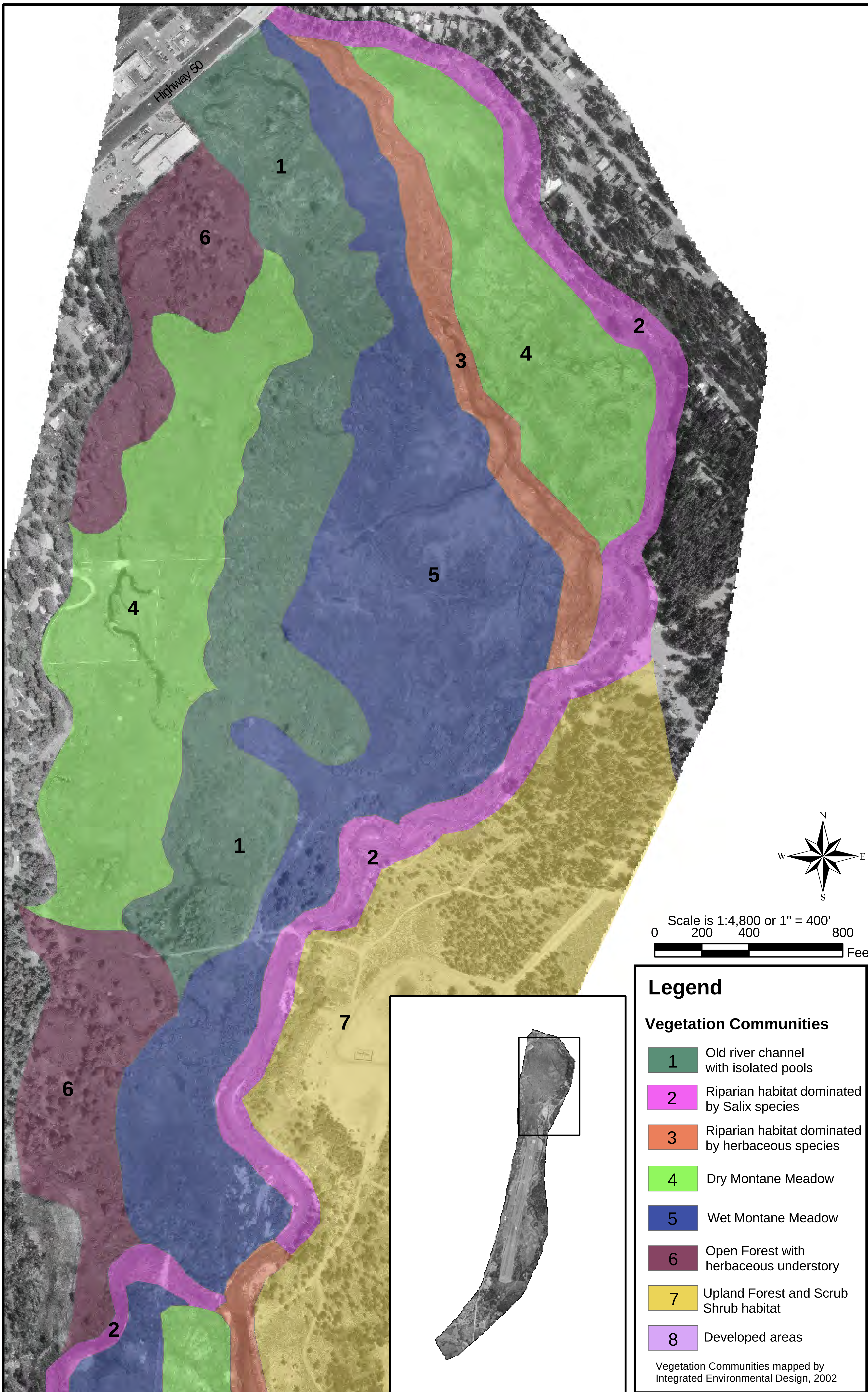
Figure III.D.1-A



Swanson Hydrology & Geomorphology
115 Limekiln Street, Santa Cruz, CA 95060
Tel: 831-427-0288 Fax: 831-427-0472

Upper Truckee River - Vegetation Communities

Figure III.D.1-B



Swanson Hydrology & Geomorphology 115 Limekiln Street, Santa Cruz, CA 95060 Tel: 831-427-0288 Fax: 831-427-0472	**Upper Truckee River - Vegetation Communities**	**Figure III.D.1-C**

damp meadows. However, it has been known to tolerate relatively dry conditions in coniferous canopy. Disturbance of this species' habitat has shown to be detrimental to its survival (Ladyman, J.A.R. 1996). *Taraxacum officinal* (Dandelion) is a colonizer of disturbed sites. However, the length of time that this species is present in a disturbed area varies between ecosystems. It can remain present after the initial site disturbance for up to 10 years (Auchmoody, L.R. and Walters, R.S. 1988).

Juncus sp. (Rushes) is typically native cool season perennials associated with many stable plant communities. However, it can be grazing induced and an indicator of disturbed sites (Evenden, A. G. 1989; Manning, M. E., Padgett, W.G. 1989; McDermott, R.E. 1953.). In overgrazed areas, *Juncus balticus* (Baltic rush) will out compete *Deschampsia sp.* (Hairgrass) and *Carex nebraskensis* (Nebraska sedge). *Arnica chamissonis* (Arnica) is a California native that occurs in moist wet meadow conditions. It is typically associated with Pine and Fir tree communities (Walker, R.E. 1992). At this time it has not been indicated as either a species associated with disturbed or stable communities. *Achillea millefolium* (Yarrow) is a pioneer species everywhere it is found (Agee, J. K. 1996). It is known to be an invader species on disturbed rangeland sites. It is particularly tolerant of competition. It has also been noted to dominate in overgrazed high summer ranges, where the undisturbed stable vegetation would be made up of Wheatgrasses (USDA. 1937).

Phalaris arundinacea (Reed canary grass) is a native to Western North America. It is tolerant of drought and saline conditions (Walker C. H. 1982). It forms competitive relationships with *Phleum pretense* (Timothy) and *Poa pratensis* (Kentucky bluegrass) (Apfelbaum S.E., Sams, C.E. 1987). It does, however, provide good ground cover in wet meadow habitat that suffers from seasonal drought. *Wyethia mollis* (Mountain mules ear) occurs in rocky soil under dry conditions and on slope habitats in the Sierra Nevada Mountain Range (Walker, R.E. 1992). The frequency of this species within the Upper Truckee River floodplain indicate the extent the floodplain alterations have influenced the ecosystem.

Much of the meadows have the potential to be classified as wetlands. Wetlands are areas that support vegetation adapted to living in saturated soil either periodically or permanently. Currently the disturbed hydrologic features of the project site are not allowing the floodplain to function as wetland storage for storm and floodwaters or as a natural water filtration system. To determine how much existing wetland is within the project site a wetland delineation would be needed. At this time only potential wetlands have been identified (Chapter III, Section D).

The dominant woody species are (1) *Salix sp.* (Salix exigua, Salix lemmoni, Salix geyeriana), (2) *Pinus jefferyi* (Jeffery Pine) and (3) *Pinus contorta ssp murryana* (Lodgepole Pine). The age class diversity of the *Salix sp*. is limited. The site in general has a minimal amount of regeneration of woody species. The riparian areas dominated by Salix species also had several Carex species and Agrostis stolonifera (creeping bentgrass) in the under story. There is not a definite separation between the riparian and meadow habitat, so many species occur in both habitat types. However, woody vegetation is not common in the meadow areas, except around the old channel and isolated pools.

In addition, to the upland and scrub-shrub habitat having coniferous trees, some of the meadow plant communities also had both *Pinus jefferyi* (Jeffery Pine) and *Pinus contorta ssp. murryana* (Lodge pole Pine), indicating that the past had consisted of dryer periods as well as wet. Therefore, the plant community defined as "Open Forest with Herbaceous Under story" was identified.

Much of the meadow and potential wetland areas appear to be in transition from wet areas to dry montane meadows. It is unclear in many locations near the riparian areas as to whether or not the plant communities are currently dependent on groundwater or surface water. Only the upland and open forest areas can clearly be defined as dependent on ground water. At this time there is not any groundwater data available to substantiate one or the other for any of the plant communities.

The current and historic grazing and the river channelization for the airport construction have had a definite influence on species composition cover and plant vigor by controlling the soil moisture regimes and potential seed requirement. Currently it is unknown how reach 1,2,3 and 4 would appear if the current land uses were not in place. However, it can be concluded that the meadow would have greater aged class diversity in the woody species and a greater diversity in herbaceous vegetation with an increased number of forbs and coverage.

III.D.3.2.2 Threatened, Endangered and Sensitive Species

Throughout the extensive botanical survey and research associated with the project site no special status species were observed. However, if at any point throughout the phases of this project one is located or observed within the site the procumbent will work with the federal, state and local environmental laws and policies that are relevant to the potential impacts to that species.

III.D.3.2.3 Noxious weeds

In Reach 3 there is Hoary cress (Whitetop). It is a noxious weed near the airport and within the proposed construction site. This perennial weed is common on disturbed soils and is currently located in an area that fill material was placed during construction of the airport.

The location of the weed is critical in its current less-than significant status in the context of this project. Both alternative 2 and 3 propose the removal of the fill in which the weed is established. The only concern is that it is a deep-rooted perennial and can reproduce from the roots. Therefore, it is important that measures be taken to secure that it is removed with the fill material and that the fill is removed from the site and placed in an appropriately chosen location.

III.D.4 Environmental Consequences

III.D.4.1 Anticipated Impacts

III.D.4.1.1 Proposed Alternative 1

The no action plan would not have a direct impact but may have a long-term negative impact on the project site. The no action plan does not limit the current landowners from altering the site further and could potentially create isolated issues with greater significance.

It is also probable that the existing conditions would remain the same. Opportunities to restore some of the original and potential ecological enhancement improvements to the site improving vegetation communities and plant vigor would not happen. If the downgrading and channelization continue condition of the floodplain would degrade further, transitioning towards a dryer and more uniform landscape.

III.D.4.1.2 Proposed Alternative 2

Impacts to the vegetation will occur during construction. The existing riparian vegetation will be removed or stressed due to the construction activities. Most of the vegetation loss will occur during ground disturbing activities and from vehicle traffic.

The specific activities associated with partially filling the gully channel in Reach 1, replacing the bridge crossing in Reach 2, replacing the ford crossing in Reach 3, modifying the concrete structures in Reach 4; and the lowering of the floodplain throughout the entire site will disturb the existing vegetation in both the riparian and meadow plant communities. However, it will also offer an opportunity for new growth to be established through plantings, seeding and natural regeneration. Because none of the species identified on the site are protected by local, state or federal policies, the impact to them is considered less than significant.

The fill material to be used, in Reach 1, for partially filling the gully in Reach 1 and old channel in Reach 4 and 5 will need to be able to support species that require solid moisture. Although the vegetation at specific locations throughout the site will be altered the negative impacts are considered less-than significant. The ecological enhancement of the floodplain would improve the diversity, plant vigor and the percent cover of the vegetation at the project site; to the extent that any short-term impact associated with the construction disturbance would be worth the long-term benefits to the plant community.

III.D.4.1.3 Proposed Alternative 3

Alternative 3 has the same potential impacts as Alternative 2 . However, because of the increase in new channel construction the opportunity to revegetate in the small window of time during the optimum fall months may be at risk. The impact associated with sediment runoff in the following spring could have a significant impact. This impact is not foreseen at this time but would require further consideration once a schedule has been laid out for the chosen alternatives.

The proposed alternative 3 also influences a greater surface area than Alternative 2. However, it is not considered to be a significant impact as long as the mitigation measures for revegetation are implemented.

The proposed construction of a new channel in several areas may require the removal of mature conifers. If these conifers are larger than 30 inches in DBH they will need to be avoided due to the current TRPA ordinance. In addition, there may also be an impact to the type of vegetation in the understory. However, this is not considered a significant impact because none of the species have special status.

III.D.4.2 Unavoidable Adverse Impacts

No unavoidable adverse impacts have been identified.

III.D.4.3 Proposed Mitigation

In general, mitigation measures fall into one of three categories (1) avoidance, (2) protection and (3) replacement. At this time revegetation after construction should reduce any impact. However, there is no special status species currently identified on the site and therefore no significant impact requiring special mitigation measures.

Prior to construction on the site, an official wetland delineation will be necessary to identify how much of the meadow area is wetland. The amount of mitigation required by the Army Corp of Engineers to issue a permit for the discharge of dredged or fill material will depend on the official delineation. However, it should be noted that both alternative 2 and 3 offer potential mitigation measures within them.

When the specific project alternative has been selected specific vegetation methods and mitigation measures can be identified. These measures will need to accommodate any appropriate federal, state and local agencies with jurisdiction requests. After construction and the mitigation measures have been completed the vegetation-monitoring program established for the project site in June of 2002 should be completed annually until the project goals are met.

III.D.5 References and Literature Cited

Agee, James K. 1996. Fire in the Blue Mountains: a history, ecology and research agenda. In: Jaindl, R.G.; Quigley, T.M , eds. Search for a solution: sustaining the land, people and economy of the Blue Mountains. Washington, DC: American Forests: 119-145

Apfelbaum, Stephen I.; Sams, Charles E. 1987. Ecology and control of reed canary grass (Phalaris arundiacea L.). Natural Areas Journal. 7(2): 69-74.

Auchmoody, L.R.; Walters, R.S. 1988. Revegetation of a brine-killed forest site. Soil

Science Society of America Journal. 52: 277-280.

Bonham, Charles D. 1988. Measurements for Terrestrial Vegetation. John Wiley and Sons Publishers, New York, New York.

Brower, James E., von Ende, Carl N. and Jerrold H. Zar 1998. Field and Laboratory Methods for General Ecology. 4th Edition. WCB/McGraw Hill Publishers, Boston Massachusetts.

Evenden, Angela G. 1989. Ecology and distribution of riparian vegetation in the Trout Creek Mountains of Southeastern Oregon. Dissertation. Corvallis, OR: Oregon State University. 156 pp.

Interior, Fish and Wildlife Service, Office of Biological Services, Western Energy and Land Use Team. 347 pp.

Ladyman, J.A.R. 1996. Distribution and Biology of Trifolim longipes subsp. neurophyllum. Pp. 262-269 In: Maschinski, J., H.D. Hammond and L. Holter, technical eds. Southwestern rare and endangered plants: Proceedings of the second conference. General Technical Report RM-GTR-283. USDA-Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

Manning, Mary E.; Padgett, Wayne G. 1989. Preliminary riparian community type classification for Nevada. USDA-Forest Service, Intermountain Region, Ogden, Utah. 135 pp.

McDermott, R.E. 1953. Light as a factor in the germination of some bottomland hardwood seeds. Journal of Forestry. 51: 203-204.

USDA(U.S. Department of Agriculture)- Forest Service. 1937. Range plant handbook. Washington, DC. 532 pp.

Walker, R.E. 1992. Community models of species richness: regional variation of plant community species composition on the west slope of the Sierra Nevada, California. Unpubl. MA Thesis, Geography, Univ of California, Santa Barbara. 155 pp.

Wasser, Clinton H. 1982. Ecology and culture of selected species useful in revegetation disturbed lands in the West. FWS/OBS-82/56. Washington, DC: U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services, Western Energy and Land Use Team. 347 pp

Whitson,Tom D.; Burrill, Larry C.; Dewey, Steven A.; Cudney, David W.; Nelson, B.E.; Lee, Richard D.; Parker, Robert. 1992. Weeds of the West. University of Wyoming, Laramie, Wyoming. 630 pp.

III.E GRAZING RESOURCES

III.E.1 Issues

Livestock grazing on the privately owned Ledbetter Meadow is thought to contribute to stream bank erosion and increased concentrations of fecal coliform within the adjacent reaches of the Upper Truckee River. The planning area has been continuously grazed on a seasonal basis for more than 100 years. Prior to 1997, livestock were allowed unlimited access to the historic river channel and overflow channel for watering during the grazing season. A grazing plan was developed in accordance with Section 73 of the Tahoe Regional Planning Agency Code of Ordinances. This plan identified stocking rates, season of use and livestock distribution improvements which have been implemented and followed by the Landowner/Operator. Cross fencing was constructed in 1998 which limited watering access to both the historic and overflow channels to that time period when Pastures 1, 3, 4, 6 and 7 (see Figure III.E.1) were being grazed. Planning considerations at the time identified these two watercourses as a source of livestock water during periods of grazing the respective pastures. Other pastures created under the plan (Pastures 2 and 5) were served by a trough/pipeline system with a domestic water supply source. Livestock numbers have been reduced and a deferred/rotational grazing system implemented. Proper Grazing Use as defined by the USDA Natural Resources Conservation Service has been satisfactorily followed since the implementation of the Plan.

Locations within the study area affected by livestock include the Sunset Ranch, which lies to the south of the Ledbetter Meadow. The Sunset Ranch, which is currently owned by the California Tahoe Conservancy (CTC), supported a privately operated equestrian trail ride enterprise until 1998. Approximately 20 to 50 horses were maintained during the summer tourist season within a paddock where they were provided supplemental feed and water. Feeding outside of the paddock was incidental and only during trail rides. The CTC is now in the process of developing a resource management plan for this area.

III.E.2 Analysis Methods and Assumptions

III.E.2.1 Impact Analysis Methods

In 1997 the initial stocking rate and the carrying capacity of the grazing unit was determined as an element of the existing grazing plan. Forage was sampled along temporary line transects using the harvesting technique described in Chapter 4 of the National Range and Pasture handbook (USDA, NRCS, 1997.) Transects were randomly placed in each proposed pasture area resulting in a total of 6 transects. Samples were taken along a 61 meter long transect at 6 meter intervals using a 0.1 square meter quadrant. Forage within the quadrant was harvested and allowed to air dry with final weights expressed as air-dry weights. This data was finally expressed in terms of animal unit months.


Figure III.E.1
Pasture Layout
W - Water Trough
1- Pasture Number
6
7
5
W
W
3
4
2
1

III.E.3 Affected Environment

III.E.3.1 Area of Influence

The Ledbetter grazing unit comprises approximately 342 acres within the study area. Of this approximately 113 acres may be described as Dry Montane Meadow: 104 acres of Wet Montane Meadow: and 124 acres of Upland Mixed Conifer. Dry and Wet Montane Meadow vegetation is comprised largely of grasses and forbs interspersed with stands of willows. Upland mixed conifer vegetation is predominately second growth mixed conifer (Pinus jeffryii, Pinus lambertiana) with a shrub under story (Purshia tridentata, Artemisa spp.). The Upper Truckee River and associated channels are a significant landscape feature within the grazing unit. The river bisects the southern end of the grazing unit, isolating Pasture 6 from Pastures 1 through 5 and 7, and eventually forms the eastern boundary. Attending seasonal channels and oxbows are prevalent throughout the grazing unit. Remnant irrigation diversions, channels and dikes extend throughout the bottomland areas. Slopes range from 0 to 1% within the bottomlands adjacent to the river, to 15% in the upland areas.

III.E.3.2 Existing Conditions

A perimeter fence enclosing 342 acres presently defines the Ledbetter grazing unit. The unit is cross-fenced creating 7 pastures of varying size (see Table III.E.1). Pastures 1,2,3 and 5 are predominately comprised of dry montane meadow; Pasture 3 and 7 are predominately wet montane meadow (or riparian); and Pasture 6 is situated in an upland, mixed conifer setting. Cow/calf pairs typically graze pastures during the summer season, which typically runs from mid June to mid October each year. The length of the grazing season and introduction and removal dates will vary depending on soil moisture conditions and forage production. During a normal year the estimated carrying capacity by all pastures is 333 Animal Unit Months.

III.E.4 Environmental Consequences

III.E.4.1 Anticipated Impacts

III.E.4.1.1 Proposed Alternative 1

As a consequence of this alternative, no modifications to the existing channels and floodplain will occur. This action does not preclude an independent action on the part of the livestock operator to improve existing fencing and livestock water facilities. The livestock operator may or may not construct exclusion fencing on the East Side of the overflow channel in pasture 4. Likewise, the livestock operator may or may not construct additional livestock water facilities to serve all pastures. Additional adjustment of the existing pasture configuration throughout this grazing unit will be at the discretion of the livestock operator.

Table III.E.1 Animal Unit Months per Pasture

Pasture	Acres	Pasture Type	Forage/ Acre (lbs.)	Animal Unit Months
1	9	Non-Irrigated Native Pasture	1000	11
2	69	Non-Irrigated Native Pasture	1000	86
3	6.5	Riparian Pasture	1500	12
4	30	Non-Irrigated Native Pasture	1000	38
5	55	Non-Irrigated Native Pasture	1000	69
6	124	Woodland	312	48
7	37	Non-Irrigated Native Pasture	1500	69

III.E.4.1.2 Proposed Alternative 2

This alternative will provide an opportunity to achieve greater control over livestock impacts on water quality by excluding access to the overflow channel. As a consequence of this proposed alternative, it will be necessary to exclude livestock from accessing revegetated stream banks throughout pastures 3 and 6 (Reaches 1 and 2) while stabilization and plant establishment is in progress. Additionally, 2500 lineal feet of exclusion fencing should be constructed east of the existing overflow channel to complement the existing cross fence between pastures 2 and 4. This will effectively exclude livestock from disturbing revegetated shorelines on the proposed ponds. Livestock movement between pastures 2 and 4 will be accomplished by constructing gates on one or more of the proposed dikes. The livestock operator as a component of an overall grazing management strategy may consider additional cross fencing throughout the grazing unit.

Since livestock will no longer have access to the overflow channel in Reach 1, additional livestock watering facilities must be constructed to serve pastures 1 and 4. This will require the installation of approximately 1200 lineal feet of pipeline and 2 water troughs.

III.E.4.1.3 Proposed Alternative 3

This alternative will create greater flexibility for the livestock operator to reconfigure existing pastures. As a result it will be possible to reconfigure pastures to a more uniform size and facilitate an improvement in livestock utilization and distribution. Filling and restoring the overflow channel will eliminate the need for a permanent cross fence separating pastures 2 and 4 in Reach 1. Removing the existing cross fence, along with the possible addition of cross fencing in adjacent pastures 2 and 5, Pastures of similar size and configuration will improve the current deferred-rotational grazing management system now practiced. Since this alternative proposes significant quantities of restoration over fill areas, temporary livestock exclusion measures such as electric fencing around such areas would be necessary to allow continued use of affected pastures. Such exclusion measures would be necessary until restored and revegetated areas have stabilized.

Creating additional opportunities for out of bank flows in reaches 1 and 2 will possibly result in greater forage production in areas so influenced. The possible changes include a longer growing season for forage species; increased annual forage production; and a possible change in forage species composition.

III.E.4.2 Unavoidable Adverse Impacts

The most probable adverse impact from implementation of either alternative 2 or 3 may result from increasing overland flows in reaches 1 and 2. Depending on the extent and timing of flooding within pastures, the potential exists that seasonal introduction of livestock may be delayed until soil moisture conditions permit their release into the pastures. If flooding occurs while livestock are present, soil disturbance and compaction may result where livestock congregate. Standing water or ponded water in oxbows which may be present after livestock introduction may present livestock health considerations related to constant emersion of hooves and legs, fecal contamination of ingested water or increased pestilence from flies and mosquitoes.

III.E.4.3 Proposed Mitigation

Channel design considerations should include timing and duration of flooding to accommodate seasonal introduction of livestock. Soil moisture, as defined in Chapter 73.2A of the Tahoe Regional Planning Agency Code of Ordinances, should accommodate livestock grazing use no later than mid June each year.

Livestock health considerations may require additional temporary or permanent exclusion fencing around flooded oxbows or other areas of standing water. El Dorado County Health Department should be consulted regarding the potential increase in flies and mosquitoes.

III.E.5 References Cited

USDA Natural Resources Conservation Service. National Range and Pasture Handbook. Chapter 4, Inventorying and Monitoring Grazing Land Resources. 1997

III.F WILDLIFE RESOURCES

III.F.1 Issues

III.F.2 Analysis Methods and Assumptions

III.F.2.1 Impact Analysis Methods

The following regulations describe federal, state, and local environmental laws and policies that are relevant to the impact analysis for wildlife.

Federal Endangered Species Act/California Endangered Species Act
In 1973, the United States Congress enacted the Federal Endangered Species Act (ESA) to protect those species that are endangered or threatened with extinction. In 1984, the State of California passed the California Endangered Species Act. The United States Fish and Wildlife Service (USFWS) is responsible for implementation of the ESA. The USFWS identifies specific species of wildlife as threatened, endangered, or sensitive.

The California Department of Fish and Wildlife (CDFG) exercises authority to implement and enforce statutes that affect wildlife, particularly those that involve sensitive species. Through a cooperative agreement with the United States Fish and Wildlife Service (USFWS), CDFG is responsible for sensitive species identified by the federal Endangered Species Act (ESA).

Migratory Bird Treaty Act
The Migratory Bird Treaty Act (MBTA) prohibits the killing, possessing, or trading of migratory birds, which include almost all bird species, except in accordance with regulations prescribed by the Secretary of Interior. The MBTA provides legal protection for any migratory bird or part, nest, or egg.

Tahoe Regional Planning Agency
Within the Lake Tahoe Basin, the Tahoe Regional Planning Agency (TRPA) has developed goals, policies, thresholds and ordinances pertaining to wildlife. TRPA has established Environmental Thresholds for wildlife that address special interest species, habitats of special significance, stream habitats, and in stream flows. These Environmental Thresholds are used to establish the significance of an environmental effect to wildlife resources in the Lake Tahoe Basin.

The Thresholds establish a non-degradation management standard for significant wildlife habitat consisting of deciduous trees, wetlands, and meadows, while providing for opportunities to increase the acreage of such riparian associations.

The TRPA has designated six species and one category of species as species of special interest because of rarity or other public interest. The Thresholds provide a minimum number of population sites and designates disturbance zones for the species identified in Table III.F.1.

Table III.F.1 TRPA Environmental Thresholds for Special Interest Species.

Species of Interest	Population Sites	Disturbance Zone (miles)	Influence Zone (miles)
Goshawk	12	0.50	3.50
Osprey	4	0.25	0.60
Bald Eagle (Winter)	2	Mapped Areas	Mapped Areas
Bald Eagle (Nesting)	1	0.50	Variable
Golden eagle	4	0.25	9.0
Waterfowl	18	Mapped Areas	Mapped Areas
Deer	-	Meadows	Mapped Areas
Peregrine Falcon	2	0.25	7.6

The TRPA Goals and Policies provide for maintenance of suitable wildlife habitats for all game and non-game indigenous species by maintaining and increasing habitat diversity. Habitats essential for threatened, endangered, or sensitive (TES) wildlife species must be preserved and enhanced. The Goals and Policies also reinforce the provisions of state and federal protection for TES wildlife species.

Stream environment zones adjoining creeks and major drainages that link islands of habitat shall be managed, in part, for use by wildlife as movement corridors. Structures proposed within these movement corridors shall be designed so they do not impede the movement of wildlife. Riparian vegetation shall be protected and managed for wildlife.

The TRPA Code of Ordinances establishes standards for wildlife resources. They require identification of potential impacts, such as habitat alteration, establish protection mechanisms, and require mitigation measures when necessary.

Sierra Nevada Framework

The United States Forest Service (USFS) maintains a list of sensitive wildlife species, which are animals for which population viability is a concern. Concern is warranted by a downward trend in population numbers, density, or habitat conditions, which would reduce a species' existing distribution. Sensitive species are managed so that Forest Service actions ensure that these species do not become threatened or endangered.

For U.S. Forest Service lands, the Sierra Nevada Forest Plan Amendment (SNFPA) and Record of Decision (ROD) (USDA 2000; USDA 2001) were used by the Lake Tahoe

Basin Management Unit (LTBMU) to delineate land allocations for special status wildlife species. The management direction provided in these documents affects special status wildlife species that might occur in the project area. The SNFPA and ROD amend management direction in national forest land management plans and regional guides, including the Lake Tahoe Basin Management Unit Land and Resource Management Plan (1988), in order to address the following five problem areas:

1. sustain old forest ecosystems;
2. protect and restore aquatic, riparian, and meadow ecosystems;
3. improve fire and fuels management;
4. combat noxious weeds; and
5. (5) sustain lower Westside hardwood ecosystems.

The SNFPA provides the following direction:

- specific guidelines and objectives for management direction and goals;
- desired future conditions expected over the next 50 to 100 years;
- standards and guidelines to be used in designing and implementing future management actions; and
- strategy for inventory, monitoring, and research to measure progress toward attainment of desired conditions and to make adjustments in management where needed (adaptive management).

The SNFPA and ROD will guide activity-level decision making in the LTBMU until they are replaced through subsequent amendment or revision. Where there is overlap between the 1988 LTBMU Land and Resource Management Plan and the SNFPA and ROD, the latter two supplant the LRMP.

The SNFPA and ROD provide management strategies and standards and guidelines that affect threatened, endangered, proposed, and sensitive (TEPS) wildlife species that might occur in the project area. The management strategies are linked to the SNFPAs network of land allocations and the standards and guideline for management in these allocations.

Land Allocation Standards and Guidelines

Broad-scale land allocations, such as *old forest emphasis areas* appear on the map included with the SNFPAs Final Environmental Impact Statement. Such allocations are designated as “mapped.” Smaller-scale land allocations, such as *northern goshawk protected activity centers* (PACs) are not shown on the map as they will be delineated by each forest. Such allocations are referred to as “unmapped.” Each land allocation has a set of standards and guidelines that determine how management is to proceed within the allocation.

Certain land allocations overlap with one another. Management direction for higher priority allocations preempts management direction for lower priority allocations. In general, land allocations that have more restrictive management direction preempt those with less restrictive direction. Mapped land allocations with more restrictive standards and guidelines supplant other mapped allocations that are lower in order of priority. Unmapped land allocations with standards and guidelines that protect special habitats or species are placed higher in the priority ordering, while land allocations that call for more active management are placed lower in the ordering.

Mapped Allocations

General Forest

The general forest is comprised of national forest lands that lie outside wilderness areas, wild and scenic rivers, PACs, den sites, southern Sierra fisher conservation area, old forest emphasis areas, California spotted owl home range core areas, and the urban wild land intermix zone. Management direction is to: (1) reduce hazardous fuels to effectively modify wild land fire behavior to reduce uncharacteristically severe wild land fire effects; and (2) to increase the numbers of large trees and the distribution and connectivity of old forests across landscapes.

Urban Wild land Intermix Zone

The urban wild land intermix zone is an area where human habitation is mixed with areas of flammable vegetation. It is comprised of two zones: an inner ¼ mile wide buffer, called the defense zone, and an outer 1 ¼ mile wide buffer, called the threat zone. Urban wild land intermix zones have highest priority for fuels treatment. Fuels in the inner defense zone are more intensively treated to prevent loss of life and property. The management directions for this land allocation are designed to attain the management objective, which is to enhance fire suppression capabilities by modifying fire behavior inside the zone and providing a safe and effective area for possible future fire suppression activities.

Unmapped Allocations

Protected activity centers (PACs) are unmapped land allocations for the northern goshawk, California spotted owl, great gray owl, and den sites for marten.

- **Northern goshawk breeding sites**: 200 acres of the best available forested habitat surrounding nest sites (or, if the nest cannot be located, the location of territorial adults or recently fledged juveniles during the fledgling dependency period) in the largest contiguous blocks possible.

Limited operating periods (LOPs) are applied to PACs during nesting seasons to protect breeding adults and their offspring as follows:

- Northern goshawk: within ¼ mile of nest site February 15 through September 15, unless surveys confirm that northern goshawks are not nesting. (It should be noted that the Tahoe Regional Planning Agency (TRPA) requires a ½ mile buffer around nests.)

The LOPs for special status wildlife species provide potential time constraints on projects in the project area. The LOPs would be implemented if any of the special status wildlife species were determined to be nesting or denning within the vicinity of the project area. Although the Framework (USDA 2001) does not include LOPs or buffer zones for willow flycatchers, the California Department of Fish and Game (CDFG) has implemented no-disturbance buffer zones of several hundred feet for any activities that could potentially impact nesting willow flycatchers.

Willow Flycatcher Habitat

The standards and guidelines for conserving willow flycatcher are based on: (1) the 82 known willow flycatcher sites in the Sierra Nevada national forests; (2) occupied willow flycatcher habitat; and (3) emphasis habitat. The activity-related standards and guidelines for this land allocation include assessing impacts of livestock grazing and surveys of willow flycatcher habitat.

Unmapped Land Allocations in the Project Area

In accordance with the Sierra Nevada Forest Plan Amendment (USDA 2001), the United States Forest Service (USFS) Lake Tahoe Basin Management Unit (LTBMU) delineated unmapped land allocations for the wildlife species of concern. These delineations are based on records of occurrences and on areas with potentially suitable habitat characteristics. Within the project area, unmapped land allocations have been delineated for willow flycatchers.

III.F.2.2 Assumptions

III.F.2.2.1 Significance Criteria

Impacts to biological resources can be considered as significant, less-than significant, or no impact. The following criteria are used to determine the significance of impacts on wildlife resources:

- Have a substantial adverse effect, directly or indirectly on any listed, candidate, sensitive, or other special status species under federal or state Endangered Species Acts, or other special status species protected under other statutes;
- Have a substantial adverse effect on the habitat, directly or indirectly, of any special status species;
- Substantially interferes with the movement of any resident or migratory fish or wildlife species; and
- Have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to

eliminate an animal community, or reduce the number or restrict the range of an endangered, rare, or threatened species.

III.F.2.3 Cumulative Actions Considered

Two other projects are currently under consideration: the Meyers to South Lake Tahoe bike path, and the Sunset Stables Restoration Project. A portion of the Meyers to South Lake Tahoe bike path would traverse east of the project area at the interface of the meadow and hill slope. An informal trail currently exists at this site, which is used by a variety of recreationists, including people walking dogs, bicyclists, and runners. Use occurs both in the summer and winter. The Sunset Stables Restoration Project is a multi-phased project to restore a portion of the Upper Truckee River and adjacent wetland and upland areas near the South Lake Tahoe airport.

III.F.3 Affected Environment

III.F.3.1 Area of Influence

The potential area of influence is considered to be within 0.5 miles of the project area's boundary and is necessary because of USFS and TRPA policies regarding limited operating periods around active goshawk nests.

III.F.3.2 Existing Conditions

III.F.3.2.1 General Wildlife

The Lake Tahoe Basin provides habitat for a broad variety of resident and migratory wildlife species. Nearly 300 species of animals inhabit the Lake Tahoe Region.

The project area is bounded by the South Lake Tahoe Airport on the west, and by residential development to the east. The urban development is bisected at its midpoint by undeveloped USFS land. Informal trails parallel the meadow/forest edge near the easternmost portion of the project area. People use the project area for dog walking, bike riding, and walking. Cattle grazing occurs in the project area in Reaches 1 and 2.

The wildlife that could occur in the project area were determined from a review of reports on wildlife conditions prepared for other projects in the general vicinity of the project area including a review of LTBMU wildlife occurrences; and observations of wildlife species and/or their sign (eg, scat, tracks) noted during the protocol-level wildlife surveys conducted in the project area. The species observed during the field surveys are listed in Table III.F.2 and include a total of 44 birds, nine mammals, two reptiles, and one amphibian.

Table III.F.2 Wildlife species observed in the Upper Truckee River Reclamation Project Area and within 0.5 miles of the project area during spring and summer surveys 2001 and 2002.

Common Name	Scientific Name
MAMMALS	
Beaver	*Castor canadensis*
Golden- mantled ground squirrel	*Spermophilus lateralis*
Western gray squirrel	*Sciurus griseus*
Raccoon	*Pyrocon lotor*
Coyote	*Canis latrans*
Chipmunk	*Eutamias spp.*
Douglas' squirrel	*Tamiasciurus douglasii*
Gopher*	*Thomomys spp.*
Vole*	*Microtus spp.*
BIRDS	
Band-tailed pigeon	*Columba fasciata*
Rock dove	*Columba livia*
Stellar's jay	*Cyanocitta stelleri*
Mountain chickadee	*Parus gambeli*
Northern flicker	*Colaptes auratus*
American robin	*Turdus migratorius*
Western wood peewee	*Contopus sordidulus*
Song sparrow	*Melospiza melodia*
Brown-headed cowbird	*Molothrus ater*
Evening grosbeak	*Coccothraustes vespertinus*
Dark-eyed junco	*Junco hyemalis*
Western wood peewee	*Contopus sordidulus*
White-crowned sparrow	*Zonotrichia leucophyrys*
Fox sparrow	*Passerella iliaca*
Western meadowlark	*Sturnella magna*
House finch	*Carpodacus mexicanus*
Western tanager	*Piranga ludoviciana*
Red-breasted nuthatch	*Sitta canadensis*
Forster's tern	*Sterna forsteri*
European starling	*Sternus vulgaris*
Yellow-rumped warbler	*Dendroica coronata*
Yellow warbler	*Dendroica petechia*
Orange-crowned warbler	*Vermivora celata*
Red-winged blackbird	*Agelaius phoeniceus*
Brewer's blackbird	*Euphagus cyanocephalus*
Savannah sparrow	*Passerculus sandwichensis*
Mountain bluebird	*Sialia currocoides*

Cooper's hawk*	*Accipiter cooperii*
Great horned owl*	*Bubo virginianus*
Cliff swallow	*Hirundo pyrrhonata*
Barn swallow	*Hirundo rustica*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Common nighthawk	*Chordeiles minor*
Mallard	*Anas platyrhynchos*
Common merganser	*Mergus merganser*
Canada goose	*Branta canadensis*
Spotted sandpiper	*Actitis macularia*
Killdeer	*Charadrius vociferus*
Common snipe	*Gallinago gallinago*
American dipper	*Cinclus mexicanus*
Belted kingfisher	*Ceryle alcyon*
Red-tailed hawk	*Buteo jamaicensis*
American kestrel	*Falco sparverius*
REPTILES	
Western fence lizard	*Sceloporus occidentalis*
Garter snake	*Thamnophis spp.*
AMPHIBIANS	
Pacific tree frog	*Hyla regilla*

*- identified by sign such as scat, tracks, feathers, and pellets

Coyotes were observed foraging in the meadows during the early morning bird surveys and their sign (e.g., tracks, scat) was present throughout the project area. Although not directly observed, raccoons preyed on the freshwater clams (*Margaritifera margaritifera*) found in the Upper Truckee River. Numerous large beds of these clams are present in the sandy areas of the river. Beavers were observed in Reach 1 and 2 of the project area. Shoreline lodges and burrows are present in these areas. Beavers or their sign (e.g., clipped branches) were not detected in other portions of the project area.

Various species of rodents occupy the project area, including chipmunks, gophers, voles, and squirrels. Although not detected via sign or direct observation, several species of shrews and weasels could occur in the project area. Bats were observed foraging during the two survey visits conducted at dusk. No roost sites consisting of abandoned buildings are present in the project area. The bridge crossings were surveyed for evidence of roosting bats. No bats or their sign (e.g., scat, urine scent) were observed. The bridges do not provide suitable roosting habitat for bats (e.g., no crevices).

The project area provides habitat for a variety of resident (e.g., Stellar's jay) and migratory bird species (e.g., evening grosbeak). Flocks of brown-headed cowbirds, an obligate nest parasite, were observed in the project area during both survey years.

Because of the Lake Tahoe basin's high altitude, few reptiles are endemic to the area. Two species were observed in the project area, the fence lizard and an unidentified species of garter snake. Tree frogs were noted in several locations in the project area where standing water was present. Although not observed, western toads (*Bufo boreas*) and long-toed salamanders (*Ambystoma macrodactylum*) could potentially occupy the project area.

III.F.3.2.2 Threatened, Endangered, and Sensitive Species

Threatened, endangered, and sensitive (TES) species are native species that are accorded special legal or management protection because of concern for their continued existence. There are several different categories of protection at both federal and state levels, depending on the magnitude of threat to continued existence and existing knowledge of population levels. Special status species are defined as follows:

- Wildlife species listed or proposed for listing or candidates for listing under federal or state Endangered Species Acts;
- Wildlife species considered Species of Special Concern by the United States Fish and Wildlife Service (USFWS);
- Wildlife species considered sensitive by other federal agencies, such as the United States Forest Service (USFS) and Tahoe Regional Planning Agency Special Interest Species(TRPA);
- California Department of Fish and Game Species of Special Concern; and
- Species protected under local jurisdictions.

Special status animal species known to occur in or near the project area and that have suitable habitat in the project area include: bald eagle, peregrine falcon, osprey, willow flycatcher, mule deer, mountain yellow-legged frog, and leopard frog. Table III.F.3 lists the special status wildlife species, along with the potential plant community types in chich they could occur, and their potential use of that plant community type.

Bald Eagle - Federally listed Threatened, TRPA Species of Special Interest
Habitat consists of mature coniferous forests with the presence of dominant and co-dominant trees (defined as trees taller and with a greater circumference of the upper canopy relative to the surrounding stand) in close proximity to large bodies of water (Golightly 1991). Bald eagle nests are usually located in uneven-aged (multi-storied) stands with old growth components. Trees selected for nesting are characteristically one of the largest in the stand or at least co-dominant with the over story (Lehman et al. 1979). Snags, trees with exposed lateral limbs, or trees with dead tops are often present in nesting territories and are used for perching or as points of access to and from the nest. Most tree perches selected by eagles provide a good view of the surrounding area (USDI 1986).

Table III.F.3 Special status wildlife species that could potentially occur in the project area, the plant community types in which they could occur, and their potential type of use. Refer to the text for a description of each species' habitat requirements and records of occurrence in the project area.

Common Name	Species Name	Plant community Types*	Potential Use
Bald eagle	*Haliaeetus leucocephalus*	1-8	Foraging
Peregrine falcon	*Falco peregrinus*	1-8	Foraging
Northern goshawk	*Accipiter gentilis*	6, 7 1-7	Breeding Foraging
Willow flycatcher	*Empidonax traillii*	2, 3 1-5	Breeding Foraging
Osprey	*Pandion haliaetus*	1-7	Foraging
Golden eagle	*Aquila chrysaetos*	1-7	Foraging
Mule deer	*Odocoileus hemionus*	1-7	Foraging
Mountain yellow-Legged frog	*Rana muscosa*	1-3[a], 5[a], 8	Breeding Foraging
Northern Leopard frog	*Rana pipiens*	1-3[a], 5[a], 8	Breeding Foraging
Waterfowl	---	1-8 1-5, 8	Breeding Foraging

* Plan community types from the vegetation resources chapter with the addition of type 8: (1) old channels with isolated pools; (2) riparian habitat dominated by *Salix* species; (3) riparian habitat dominated by herbaceous vegetation; (4) dry montane meadow; (5) wet montane meadow; (6) open forest with herbaceous understory vegetation; (7) upland forest and scrub-shrub habitat; and (8) river channel.

[a] where water is present

The Tahoe Basin contains wintering habitat for bald eagles, consisting of mid to late successional stages of montane riparian and mixed conifer forest (USDA 1988). The Pacific Bald Eagle Recovery Plan identifies four nesting territories in the Lake Tahoe Basin, three of which are targeted for the California side of Lake Tahoe (USDI 1986).

Bald eagles historically nested in the Lake Tahoe Basin. However, between 1971 and 1995, no confirmed nesting pairs were sighted. In 1996 an unsuccessful nesting attempt by a pair of bald eagles occurred on the east side of the Lake Tahoe Basin. In 1997, a pair of bald eagles successfully fledged young in a territory on the California side of Lake Tahoe. Subsequent nesting attempts have been variously successful.

Bald eagles have been recorded in the Upper Truckee River Marsh where the river enters Lake Tahoe. However, bald eagles have not been recorded in the project area (USDA 2002). As part of their environmental compliance, the South Lake Tahoe Airport contracts with an individual to conduct winter (November to March) avian surveys in the vicinity of the airport. These surveys are conducted from the northernmost portion of the airport (Reach 1 and 2) north to Lake Tahoe. The surveyor has observed bald eagles in the marsh area north of Highway 50, but not in the vicinity of the project area.

The project area is not a TRPA mapped bald eagle management zone or mapped winter habitat. The project area does not contain preferred nesting habitat, and given the amount of disturbance due to the airport (e.g., noise) and dispersed recreationists, it is considered unlikely that bald eagles would nest in the project area. Bald eagles could potentially forage in the project area. However, the project area does not contain the concentration of potential prey compared to that found in the Upper Truckee Marsh (e.g., waterfowl). Prior to the human modifications due to land use, resource extraction, and development of the airport, the project area probably provided consistent foraging habitat for bald eagles.

<u>Peregrine Falcon</u> – USFWS Species of Concern, TRPA Species of Special Interest
Nesting habitat consists of large vertical rock cliffs near water sources and diverse vegetation types (USDA 1988). Preferred nesting sites are located near habitat with a high avian prey population. The diet of the peregrine falcon is almost exclusively avian (Dunne et al 1988). Peregrine falcons historically nested in the Sierra Nevada, mainly near large bodies of water (CDFG 1987). No nesting pairs are currently known in the Tahoe Basin.

Suitable nesting habitat of rock cliffs near water sources and diverse vegetation is not present in or near the project area. However, the habitat in the project area could be used for foraging by falcons. To date, no peregrine falcon sightings have been recorded in or adjacent to the project area (USDA 2002), although no specific surveys for peregrine falcons have been conducted. Most observations of peregrine falcons have been made in the south shore region of the Tahoe Basin. A reintroduction program in the south shore region of the Lake Tahoe Basin occurred during 1990 and 1991. Surveys conducted in the basin since those reintroductions have not detected any peregrine falcons (USDA

2002).

<u>Northern Goshawk</u> - USFS sensitive, TRPA Species of Special Interest, USFWS Species of Special Concern

Preferred habitat consists of older-age, mixed coniferous and deciduous forest habitat. The habitat also consists of large trees for nesting, a closed canopy for protection and thermal cover. Open spaces are necessary to allow maneuverability below the canopy. Snags, down logs, and high canopy cover are critical habitat features. The former two are also an important component used by numerous prey species. Many of the species that provide the prey base for goshawks are associated with open stands of trees or natural openings containing an under story of native shrubs and grass.

Goshawk nest sites and perch locations are associated with forest stands that have a higher basal area, more canopy cover, and more trees per hectare than surrounding areas. Nest trees for this species are commonly located on benches or basins surrounded by much steeper slopes (Call 1979). Mature trees serve as nest and perch sites, while plucking posts are frequently located in denser portions of the secondary canopy (i.e. crown closure is 80% or greater). The same nest might be used for several seasons, but alternate nests are common within a single territory.

The chronology of nesting activity in goshawks varies annually and elevationally. In general, nesting activities are initiated in February. Nest construction, egg laying, and incubation occur through May and June. Young birds hatch and begin fledging in late June and early July. They are independent by mid-September (USDA 1992).

For goshawks, recommendations for managing forests call not only for maintaining nest stands, but also for developing forest environments that support a variety of their prey species in a 2430-hectare area surrounding each nest (Reynolds et al. 1992). Important components of foraging areas include snags and down logs for prey base populations (Reynolds 1983; USDA 1991). A dependence on one type of prey could conceivably lead to a decline in a predator population if that prey species declined (McGowan 1975; Newton 1979). The diet of the goshawk is typically varied and is not dependent on only one or a few species. Small mammals and birds are the goshawks' primary prey (Verner and Boss 1980; Fowler 1988).

The TRPA and LTBMU enforce a limited operating period within 0.5 miles of active goshawk nests between March 1 and August 31, after which time most juveniles are fledged. Since September 1993, the TRPA Code of Ordinances Section 78.3.A(1), which mandates creation of the 0.5 mile radius around each nest (approximately 500 acres), has been interpreted by the agency as the most suitable goshawk habitat within 500 acres around each nest.

The project area does not contain suitable nesting habitat for northern goshawks, however potentially suitable nesting habitat is present within 0.5 miles of the project area. The USFS has a record for a historic nest northwest of the airport in the vicinity of Reach 3.

However, the nest has not been active since 1989. Because a limited operating period would apply to any project activities within 0.5 miles of an active goshawk nest, surveys for nesting goshawks were conducted in potentially suitable habitat within 0.5 miles of the project area. Goshawk surveys were conducted in accordance with Survey Methodology for Northern Goshawks in the Pacific Southwest Region, U.S. Forest Service (2 August 2000). No goshawks were detected during the surveys conducted in 2001 and 2002. Except for the nest location cited above, the USFS does not have any records of goshawk detections in the project area or in other locations within 0.5 miles of the project area. The forested habitat within 0.5 miles of the project area does not generally have preferred nesting habitat characteristics, and it is considered unlikely that goshawks would nest within 0.5 miles of the project area.

Willow Flycatcher - USFS sensitive, California State-listed Endangered

Willow flycatchers are summer resident breeders in the Sierra Nevada. Suitable breeding habitat for willow flycatchers includes large, open stands of willows in wet meadows. The presence of water during the breeding season is an important habitat component. The minimum size meadow is assumed to be 0.62 acres (Fowler et al. 1991). While wet meadows are the most common habitat used for breeding, willow flycatchers have been found breeding in riparian habitats of various types and sizes, including grasslands, boggy areas, riparian deciduous shrubs along streams, and small lakes and ponds surrounded by willows with a border of meadow or grassland. Breeding populations of willow flycatchers in the Sierra Nevada can occur in isolated mountain meadows up to 8,000 feet in elevation (Harris et al. 1988).

Willow flycatchers arrive at their breeding territories in early May and nesting begins between late May and late July. The cup-shaped nests are usually between 3.7 to 8.3 feet above the ground and are found most often near the edge of clumps of deciduous riparian shrubs (Sanders and Flett 1989; Harris 1997). Eggs are incubated about twelve days and chicks fledge after 12-15 days. The adults and fledglings generally remain in the breeding area through August. Willow flycatchers forage by either aerially gleaning or hawking insects.

Alteration and loss of riparian habitats are believed to be the main causes for declining breeding populations of willow flycatchers (Sanders and Flett 1989; USDA 1992). Other factors that might have contributed to its decline include nest parasitism by brown-headed cowbirds (*Molothrus ater*), disturbance and habitat degradation from grazing, and events occurring on wintering grounds (Serena 1982; Harris et al. 1987).

Suitable willow flycatcher habitat is present throughout the project area. Surveys for willow flycatchers were conducted in accordance with A Willow Flycatcher Survey Protocol for California June 6, 2000 (Bombay et al. 2000) in 2001 and 2002. No willow flycatchers were detected during the surveys.

The LTBMU has delineated both suitable and emphasis habitat within the project area. Emphasis habitat is defined as meadows larger than 15 acres that have standing water on

June 1 and a deciduous shrub component. No occupied habitat or willow flycatcher territories are mapped in the project area.

<u>Osprey</u> – TRPA Species of Special Interest
Ospreys are fish eating raptors that nest near water. They migrate north to their nesting areas, including the Lake Tahoe Basin, in mid-March and early April. Pair bond and nest site fidelity are thought to be maintained year after year (Herron et al. 1985). Ospreys build large platform nests from sticks. The nests are usually located in trees, but pairs have also been known to construct nests on human-made structures such as power poles and docks. Pairs add material to their nests year after year until a storm destroys the structure or a supporting base collapses under the weight of the building material. Eggs are usually laid in late April and early May and hatch 35 days later. The young fledge in late July and early August. Beginning in mid-September and through October, ospreys migrate back to their winter range.

According to agency records (e.g., USFS, TRPA), ospreys do not nest in the project area. No ospreys or their nests were observed in the project area during the field surveys. Ospreys are known to forage in the Upper Truckee River marsh located north of the project area where the river enters Lake Tahoe. Ospreys could potentially nest in the project area, but it is considered unlikely because suitable nesting trees and structures are not present.

<u>Golden Eagle</u> – TRPA Species of Special Interest
The golden eagle inhabits mountainous or hilly terrain, hunting over open country for small mammals, snakes, birds, and carrion. Mate selection begins in late January and February. Pair bonds are generally assumed to last until one mate dies. Golden eagles nest in cliffs or in trees. Their nests are large bulky structures constructed from sticks up to two inches in diameter, which are interwoven with smaller sticks, brush and miscellaneous vegetation (Herron et al. 1985). Eggs hatch within about 41-45 days and the young fledge at approximately 10 weeks of age.

Golden eagles have occasionally been documented near Mount Rose, in the northern portion of the Lake Tahoe basin, but they have seldom been recorded in other areas of the Tahoe Basin. Golden eagles are more typical inhabitants of the Great Basin Desert, which is east of the Tahoe Basin (Ryser 1985).

No recent sightings of golden eagles have been documented in or near the project area (USDA 2002). No suitable nesting habitat, such as cliffs, is present in the project area. While golden eagles could forage in the project area, it is considered unlikely due to a lack of records of such use and a lack of nesting habitat in the general geographic region.

<u>Mule deer</u> - USFS Management Indicator Species, TRPA Species of Special Interest
The project area contains mapped summer range for the Carson deer herd. Deer habitat in the LTBMU consists of summer range only; mostly in the form of meadows and early to mid-successional vegetation stages with brush that can be used for forage and cover (USDA 1988). Preferred habitat requirements for fawning include undisturbed meadow

and riparian areas that provide hiding cover and succulent forage. Mule deer preferentially browse on shrubs rather than graze on forbs and grasses. Preferred shrubs are mostly in the rose family and include bitterbrush, cliff-rose, and rose. Willows and many other riparian species are also favored.

To avoid heavy snows and reduced forage, mule deer migrate primarily altitudinally. The regional migrations of the Carson deer herd entail movements from summer range into lower elevation winter range, which is located outside the Tahoe Basin, east of the project area.

The project area is located near the summer range of the Carson Deer Herd. No mapped migration routes or critical winter, fawning, or summer range habitat for the Carson Deer Herd occurs in or near the project area (USDA 2002). No mule deer or their sign (e.g. scat and tracks) were observed in or near the project area.

Mountain Yellow-legged Frog – USFS Sensitive Species

Preferred habitat for mountain yellow-legged frog is well-illuminated, sloping banks of meadow streams, riverbanks, isolated pools, and lake borders with vegetation that is continuous to the water's edge (Zeiner et al. 1988; Martin 1992). Suitable breeding habitat is considered to be low gradient (up to 4%), perennial streams and lakes. These stream types generally have the potential for deep pools and undercut banks, which provide habitat for this frog. In the Sierra Nevada, this frog occurs from 4,500 to 12,000 feet in elevation (Jennings and Hayes 1994). Aquatic and terrestrial invertebrates are the primary foods for adults. These frogs are seldom observed far from water, although they will move overland to disperse to other pond habitats (USDA 1999).

Breeding occurs between May and August in high elevations, after meadows and lakes are free of snow and ice. In lower elevations, breeding occurs between March and June once high water in streams subsides. Eggs are deposited underwater in clusters along stream banks or on emergent vegetation. Tadpoles require at least one year before metamorphosis, but at high elevations may take up to three years before transformation (Knapp 1994). Tadpoles and adults over winter underwater in deep pools with undercut banks that provide cover (Martin 1992). At high elevations, this frog requires relatively deep lakes (over 5 feet) that do not freeze solid in winter (USDA 1999).

Garter snakes and introduced trout prey on mountain yellow-legged tadpoles (Zeiner et al. 1988). The decline of mountain yellow-legged frogs in the Sierra Nevada has been attributed to the introduction of trout during the last century (Bradford et al. 1993; Knapp 1994). Because the adults over winter underwater and the tadpoles take more than one season to metamorphosis, they are vulnerable to predation by introduced fish (Knapp 1994).

The project area was surveyed for mountain yellow-legged frogs in May and June. Surveys were conducted both during the day and twice in the early evening. No eggs, larvae, or adults of mountain yellow-legged frogs were observed nor were any calling males heard. There are no agency records (e.g., USFS) for mountain yellow-legged frogs in or near the project area. Potential habitat is present in the project area where suitable breeding and dispersal habitat occurs within meadows, ponds, and riparian habitats.

Northern Leopard Frog – USFS Sensitive Species
This frog is highly aquatic and is typically found in springs, slow-flowing streams, marshes, bogs, ponds, canals, and reservoirs. Although found in semi-permanent water in many habitat types, they require permanent aquatic habitat to breed, feed, and over winter. Emergent or submergent vegetation may be necessary both for oviposition and refuge during the breeding season, although the degree to which this species require vegetation in the aquatic habitat where they deposit their eggs has not been quantified or experimentally evaluated. A dense, relatively tall, grass or forb-dominated habitat with must occur in the vicinity of the aquatic habitat used for egg laying and over wintering (Merrell 1977; Jennings and Hayes 1994). To avoid desiccation, leopard frogs need to be near moist substrate in the vicinity of aquatic habitat.

Adults emerge from underwater over wintering sites that consist of small pits the frogs excavate in the bottom mud. Breeding is initiated in spring after the likelihood of a deep freeze is low. Eggs hatch in 8 to 15 days and tadpoles metamorphose two to six months later (Merrell 1977; Morrey 1988). Females reach sexual maturity in three to four years and males become sexually mature at two to three years.

Stebbins (1966, 1985) considered leopard frogs in the vicinity of Lake Tahoe native amphibians. However, historical evidence indicates that at least some populations of leopard frogs around Lake Tahoe might have been introduced (Jennings and Hayes 1994).

Riparian surveys conducted by LTBMU biologists for the Tahoe Basin watershed assessment project included surveys for amphibians, but failed to detect northern leopard frogs in the Lake Tahoe basin. No eggs, larvae, or adults of the northern leopard frog were detected in or near the project area during the field surveys conducted for this project. It is unlikely that this species occupies the project area.

Waterfowl – TRPA Species of Special Interest
Preferred habitat for waterfowl includes marshes, wet meadows, creek drainages, and along the shallow shorelines of lakes. The primary nesting area used by waterfowl in the LTBMU is the Upper Truckee River marsh, which is located several miles north of the project area (USDA 1988). More than half of the marsh has been replaced by urban development (USDA 1988). The waterfowl observed in the project area were common species such as Canada geese, mallards, and mergansers. The latter two species were seen most frequently in reaches 5 and 6 where logs in the river provided perch sites and cover, and pools were present. Spotted sandpipers and killdeer were frequently observed along the sandy, open shores of the river. Both are ground nesting species that nest in the project area.

A total of 18 sites within the Lake Tahoe Basin are designated as mapped waterfowl habitat by TRPA. Mapped waterfowl habitat is present in the Upper Truckee River Marsh north of Highway 50 and the project area, but the mapped habitat does not encompass the project area.

III.F.4 Environmental Consequences

III.F.4.1 Anticipated Impacts

III.F.4.1.1 Proposed Alternative 1

Proposed Alternative 1 is the No Action Plan. Under this alternative, existing conditions would remain the same. No habitat modification would occur and project area wildlife would not be disturbed or displaced due to construction activities. Opportunities to restore some of the original and potential ecological values of the floodplain areas and provide ecological enhancement of the project area, which would improve habitat for wildlife, would not occur. If the gully continues to erode and capture the river's flow in Reach I, the predicted drying of the meadow would continue. This could lead to an eventual change in the project area habitat if riparian habitat decreases because of the drier regime. The wildlife species composition of that portion of the project area might then shift to fauna adapted to drier meadows with less shrub cover. Opportunities to develop pools and other components of suitable fish habitat, which would improve foraging opportunities for piscivorous birds, would not occur.

III.F.4.1.2 Proposed Alternative 2

Impact 1. Implementation of Alternative 2 will result in disturbance to wildlife and temporary loss of habitat.

Impacts to wildlife that occupy the project area will occur as a result of construction activities, vegetation removal, and ground disturbance necessary for replacement of the private bridge crossing (Reach 2); partial filling of the gully channel (Reach 1); replacement of the ford crossing with a bridge (Reach 3); modification of the diversion dam (Reach 4); activities to restore the floodplain and enhance the channel banks (e.g., lowering the terrace to bankfull floodplain elevation); installation of logs and boulders for stream habitat enhancement (Reach 3, 4, 5, 6); creation of meander belt (Reach 5); and vegetation plantings (all reaches).

Construction activities can directly impact wildlife populations by loss or displacement of individuals during construction due to mechanical activity, noise, and increased human presence. The direct loss of individual animals of smaller wildlife species with limited mobility (e.g., small mammals such as voles, shrews, and gophers) could occur during construction from ground-disturbing activities and from vehicle traffic. The wildlife species that could experience mortality or temporary displacement are relatively abundant and common in the Lake Tahoe Basin. These species are not protected by local, state, or federal policies. As a result, impacts to these species are considered less than significant and no mitigation is required.

A decrease in the small mammal population could temporarily affect the prey base for predators such as coyotes and raptors that forage in the project area. However, the affected area of disturbance for each component of Alternative 2 is small compared to the available habitat for both prey and predators. Thus, no significant impacts to mammalian predators are expected as a result of Alternative 2.

Disturbances from construction of the various project components could cause more mobile species of wildlife (e.g., birds, medium and large-sized mammals) within and adjacent to a construction site to move to undisturbed habitat. If adjacent habitats are fully occupied, these animals might need to travel farther to find unoccupied habitat. The displacement due to construction is temporary and would last only for the duration of construction activities. Animals displaced due to projects activities would be able to return to a construction area once the construction activities have ceased. Since construction activities will occur during daylight hours, the potential for disturbance to nocturnal and crepuscular species of wildlife (e.g., coyotes, bats, owls, some rodent species) will be limited.

Impacts from construction of the various components of Alternative 2 will be localized to the specific project site (e.g., bridge replacement of stream reach), the associated access roads, and staging areas. The impacts will be temporary and will persist only as long as construction activity is taking place at a given location. Construction activity will temporarily increase vehicle traffic in a given portion of the project area. Fatalities or injuries to wildlife from construction vehicles should be minimal since the temporary dirt access roads will naturally restrict travel speed. After construction of the Alternative 2 project components, vehicle traffic in the project area will cease and the roads will be re-vegetated.

Following the implementation of Alternative 2, habitat suitability will not be adversely affected for common wildlife species or any special status wildlife species that may occupy the project area. No permanent loss of habitat will occur as a result of any of the Alternative 2 project components. However, the habitat at each project location may be altered from its existing condition during and following construction.

Although the project components of Alternative 2 will modify some portions of the project area's existing habitat, these modifications are not considered a significant impact because they would restore some of the original and potential ecological values of the floodplain areas and provide ecological enhancement of the project area.

Impact 2. Implementation of Alternative 2 may result in disturbance to nesting willow flycatchers and other migratory birds.

Willow flycatchers and other migratory birds, such as the yellow warbler, orange-crowned warbler, and song sparrow, may use the habitats within the project area for nesting. Depending on the timing, removal of riparian and forest habitat for construction of Alternative 2 components could cause breeding failure if the disturbance occurs during nest building activities, incubation, and/or prevents the young from successfully fledging from their nest. The construction activities and the associated mechanical and human disturbance may cause any nesting birds to abandon their nest with a concomitant loss of productivity for the breeding season.

For special status bird species such as the willow flycatcher, the loss of a nest and/or young is considered a potentially significant impact and mitigation is required. For other bird species covered by the MBTA, the loss of a nest and/or young would adversely affect the breeding success of a specific pair of birds, but would not significantly affect the species' population. However, destruction of active nests, eggs, or young is a violation of the MBTA and is considered a potentially significant impact, which requires mitigation.

Impact 3. Construction activities could directly or indirectly impact mapped willow flycatcher habitat.

Some project components of Alternative 2 (e.g., Reach 1) may require the permanent or temporary removal (e.g., cutting to the ground) of willows and disturbance of riparian habitat. This could reduce the amount of LTBMU mapped riparian habitat available for nesting and foraging willow flycatchers. Although implementation of Alternative 2 would ultimately improve riparian habitat conditions (e.g., raising the ground water table level in Reach 1) and the disturbance would be temporary, loss or disturbance to willow flycatcher habitat is a potentially significant impact and mitigation is required.

III.F.4.1.3 Proposed Alternative 3

Potential impacts from Alternative 3 are the same as those described for Alternative 2 under Impacts 1 through 3. Three components of Alternative 3, including the construction of 3,500 LF of new channel in Reach 3, construction of 5,500 LF of new channel in Reach 5, and construction of 3,950 LF of new channel, would require a longer period of time to implement when compared to the Alternative 2 project components. In addition, a greater proportion of the project area would be affected by construction of these Alternative 3 project components compared to Alternative 2. However, the longer period of construction is not a significant impact as long as the mitigation measures proposed for Alternative 2 are implemented. The greater spatial extent of the construction area is not expected to be a significant impact due to the minimal amount of habitat affected compared to the surrounding available habitat.

Filling the entirety of both gully channels in Reach 1 would remove potential wildlife habitat for waterfowl and amphibians. Partially filling the gullies rather than completely filling them (i.e., Alternative 2) would allow some isolated wetlands to remain within unfilled portions of the gully and tributary channels, which would provide foraging and breeding habitat for a variety of wildlife, including waterfowl and amphibians. However, because the waterfowl and amphibians that could occur in this portion of the project area have no special status, the removal of this habitat is not considered a significant impact.

If Alternative 3 is selected, the mitigation measures proposed for Alternative 2 must be implemented.

Impact 4. Implementation of Alternative 3 may result in disturbance to nesting northern goshawks.
Construction of the new channel in Reach 6 will require removal of trees, primarily lodge pole. Lodge pole pine forest is a common habitat type and removal of trees is not considered a significant adverse impact. The removal would not lead to a significant reduction in canopy cover or forest characteristics for any special status wildlife species that depend on this habitat type. However, although it is considered unlikely, goshawks could potentially nest in a lodge pole tree in this portion of the project area. Removal of a nest tree used by northern goshawks would be considered a significant adverse impact and mitigation is required.

III.F.4.2 Unavoidable Adverse Impacts

No unavoidable adverse impacts have been identified.

III.F.4.3 Proposed Mitigation

Mitigation measures are designed to mitigate significant impacts to a level of less than significant, if possible. Those impacts that cannot be mitigated to a level of less than significant are identified as unavoidable significant impacts.

Recommended mitigation measures generally follow a three-tiered approach:

- *Avoidance* – This is the most effective type of mitigation, wherein important habitat or other resources are avoided through project design;
- *Protection* – These are measures that allow the remaining habitat to continue to function in as close to the existing state as possible; and
- *Habitat Replacement* – Replacement of sensitive habitat types lost by the development of the project.

MITIGATION MEASURES

- Prior to any construction, a protocol-level survey will be conducted for willow flycatchers in the project area. If nesting willow flycatchers are detected, the project proponent will consult with the USFS and TRPA wildlife biologists to delineate a protected activity center around the nest site and to implement a limited operating period.
- Because construction activity will take place during the nesting season, a nesting bird survey will be conducted prior to vegetation removal to determine if nesting activity is occurring in the vicinity of the each construction site. A qualified biologist shall conduct the survey within 30 days prior to construction. If no nests are found during the survey no additional measures are required. However, if an active nest is found during the survey, or at any time during construction, no construction activities shall occur within 250 feet of the nest until the young have fledged from the nest and the nest is determined by a qualified biologist to be inactive. To narrow the scope of the nesting survey and to reduce the possibility

of scheduling complications due to any nesting birds, consideration should be given to removal or falling on location, of any riparian vegetation or trees at a project component's site in fall or early spring. Vegetation removal prior to initiation of any nesting activities will prevent birds from nesting in a specific project component's location. However, surveys for ground-nesting birds will still be needed.

- In riparian habitat, the minimal area necessary for project construction should be disturbed. To the extent possible, staging areas and road building should be placed outside of mapped willow flycatcher habitat.
- Prior to the removal of any trees in Reach 6, a survey for nesting northern goshawks will be conducted. If nesting goshawks are detected, the TRPA limited operating period and protected activity center will be applied to the nest.
- If any special status wildlife species is found nesting or denning in the project area, the project proponent will consult with USFS and TRPA wildlife biologists regarding the implementation of any necessary limited operating periods and protected activity centers.

III.F.5 **References and Work Sited**

Bombay, H., T.M. Ritter, and B.E. Valentine. A willow flycatcher Survey Protocol for California. June 6, 2000.

Bradford, D.F., F. Tabatuabai, and D.M. Graber. 1993. Isolation of remaining populations of the native frog, *Rana muscosa*, by introduced fishes in Sequoia and Kings Canyon National Parks, Ca. Conservation Biology 7: 882-888.

California Department of Fish and Game. 1987. American peregrine falcon five-year status report. 15 pp.

Call, M.W. 1979. Habitat management guides for birds of prey. U.S. Dep. Interior, Bureau of Land Management. Tech. Note TN-338. 70pp.

Golightly, R.T. 1991. An Evaluation of the Tahoe Basin for the Support of Nesting and Wintering Bald Eagles, Humboldt State University, Arcata, CA.

Dunne, P., D. Sibley, and C. Sutton. 1988. Hawks in Flight. Houghton Mifflin Co. Boston, MA.

Fowler, C. 1988. Habitat capability model for the northern goshawk. USFS Tahoe National Forest, Nevada City, Ca. 21pp.

Fowler, C.B., Valentine, S.S., and M. Stafford. 1991. Habitat suitability index model: willow flycatcher (*Empidonax traillii*). USDA Forest Service, Tahoe National

Forest.

Harris, J.H. 1997. Draft – survey protocol for willow flycatchers on national forest service lands in the pacific southwest region. USDA Forest Service.

Harris, J.H., S.D. Sanders, and M.A. Flett. 1987. Willow flycatcher surveys in the Sierra Nevada. Western Birds 18:27-36.

Harris, J.H., S.D. Sanders and M.A. Flett. 1988. The status and distribution of the willow flycatcher in the Sierra Nevada: results of the 1986 survey. California Department of Fish and Game. Wildlife Management Division Administrative Report. 88-1. 32 pp.

Herron, G.B., C.A. Mortimore, and M.S. Rawlings. 1985. The Biology and Management of Raptors. Nevada Department of Wildlife. Biol. Bull No. 8.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game, Final Report.

Knapp, R. 1994. Wilderness Record. Volume 19, Number 2. Davis, Ca.

Lehman, R. 1979. A Survey of Selected Habitat Features of 95 Bald Eagle Nest Sites in California. California Department of Fish and Game, Administrative Report 79-1. October 1979. 23 pp.

Martin, D.L. 1992. Sierra Nevada Anuran Guide. Canorus, Ltd. Ecological Research Team, San Jose, CA.

McGowan, J.D. 1975. Distribution, density, and productivity of goshawks in interior Alaska. Fed. Aid Wildl. Rest. Proj. Rep. Job 10.6R. Alaska Fish and Game Depart., Juneau, AK.

Merrell, D.J. 1977. Life history of the leopard frog, *Rana pipiens* in Minnesota, Occasional Papers of the Bell Museum of Natural History, Univ. of Minnesota (15):1-23.

Morrey, S. 1988. Northern leopard frog (*Rana pipiens*). In Zeiner, D.C., W.F. Laudenslayer, and K.E. Mayer (eds). California's Wildlife, Volume I: Amphibians and Reptiles. California Department of Fish and Game, Sacramento, Ca. 272 pp.

Newton, I. 1979. Population ecology of raptors. Buteo Books, Vermillion, SD.

Orr, R.T. and J. Moffitt. 1971. Birds of the Lake Tahoe Region. California Academy of Sciences. San Francisco.

Reed, S. 1979. Bald Eagle Management Plan for the Lake Tahoe Basin Management

Unit. Lake Tahoe Basin Management Unit.

Reynolds, R.T. 1983. Management of western coniferous forest habitat for nesting Accipiter hawks. USDA Forest Service, Gen. Tec. Rep. RM-102, Ft. Collins, CO.

Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, Jr., G. Goodwin, R. Smith, and E.L. Fisher. 1992. Management recommendations for the northern goshawk in the southwestern United States. USDA Forest Service, Gen. Tech. Rep. RM-217, Ft. Collins, Co.

Ryser, F.A. 1985. Birds of the Great Basin. University of Nevada Press.

Sanders, S. and M.A. Flett. 1989. Ecology of a Sierra Nevada Population of Willow Flycatchers (*Empidonax traillii*), 1986-87. State of California, The Resources Agency, Department of Fish and Game, Wildlife Management Division Non-game Bird and Mammal Section.

Serena, M. 1982. The status and distribution of the willow flycatcher (*Empidonax traillii*) in selected portions of the Sierra Nevada, 1982. Calif. Dept. of Fish and Game, Wildlife Management Branch Admin. Report No. 82-5. 28 pp.

Stebbins, R.C. 1966. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Company, Boston, Mass. USA.

Stebbins, R.C. 1985. A Field Guide to Western Reptiles and Amphibians. Second Edition, revised. Houghton Mifflin Company, Boston, Mass. USA.

Steinhart, P. 1990. California's Wild Heritage, Threatened and Endangered Animals in the Golden State. California Department of Fish and Game, California Academy of Science, and Sierra Club.

Tahoe Regional Planning Agency. 1991. Evaluation Environmental Threshold Carrying Capacities and the Regional Plan Package. November 4, 1991.

United States Department of Agriculture (USDA) 1988. Land and Resources Management Plan. Forest Service, Region Five, Tahoe National Forest. Lake Tahoe Basin Management Unit. South Lake Tahoe, CA.

----- Forest Service Manual 2670. Threatened and Endangered, and Sensitive Plants and Animals.

-----1991. Threatened, Endangered, and Sensitive Species of the Intermountain Region. Regulation Guide Prepared by Fish and Wildlife Staff. Intermountain Region, Ogden, UT.

-----1992. Survey Protocol for Willow Flycatchers (*Empidonax traillii*) on National Forest Service Lands in the Pacific Southwest Region (Draft). June.

-----1999. Biological evaluation birds, mammals, amphibians, reptiles, fish, invertebrates, Donner Summit snow-park expansion project. Truckee District, Tahoe National Forest. June 30, 1999.

----- 2000. Survey Methodology for Northern Goshawks in the Pacific Southwest Region, U.S. Forest Service (2 August 2000).

-----2002. Lake Tahoe Basin Management Unit wildlife files of species sightings. Forest Service, Region Five, South Lake Tahoe, CA.

United States Department of the Interior. 1973. Endangered Species Act, 16 U.S.C. 1531-1544. Fish and Wildlife Service.

-----. 1982. The Pacific Coast American Peregrine Falcon Recovery Plan. In cooperation with Pacific Coast American Peregrine Falcon Recovery Team. October 12.

-----1986. Recovery Plan for the Pacific Bald Eagle. Portland, OR.

Verner, J. and A.S. Boss, technical coordinators. 1980. California wildlife and their habitats: Western Sierra Nevada. USDA Forest Service, PSW-37, Berkeley, Ca 439pp.

Whitaker, J.O. 1980. The Audubon Society Field Guide to North American Mammals. Knopf, New York.

Zeiner, D.C., W.D. Laudenslayer, K.E. Mayer and M. White. California Wildlife: Volume III: Mammals. California Department of Fish and Game, Sacramento, Ca. 407pp.

Zeveloff, S.I. 1988. Mammals of the Intermountain West. University of Utah Press, Salt Lake City. 365 pp.

III.G RECREATION AND OTHER LAND USES

III.G.1 Issues

The proposed project does not present any major issues with regards to recreational resources.

III.G.2 Analysis Methods and Assumptions

III.G.2.1 Impact Analysis Methods

Analysis of impacts to recreation must consider two factors, 1) the loss of recreational use of a site, and 2) a reduction in the quality of recreation at a site. For the Upper Truckee River restoration project, short-term impacts due to construction and long-term impacts due to river restoration must also be taken into account.

In order to assess short-term construction impacts, informal field surveys were conducted to estimate recreational access along this segment of the Upper Truckee River, current recreational quality, and recreational usage. These surveys were performed on Wednesday June 26 and Saturday July 20, 2002. By comparison of the potential construction impact zone with existing recreational access, the loss of recreational use was estimated.

The current overall quality of recreational usage at the project site was compared to the potential quality of recreation usage during and after construction. This provided a basis for the assessment of the impacts of construction on current recreation usage and the impacts of river restoration on future recreation usage.

These impacts were then compared to current weekday and weekend recreational usage, and the availability of nearby alternate recreation resources to assess the overall impacts on recreational usage from both short-term construction activities and long-term river restoration after project completion.

III.G.2.2 Assumptions

1. No new recreation facilities will be created during restoration activities.
2. Through information gathered during informal recreation field surveys, it is assumed that most recreation usage is by local residents. The absence of public recreational facilities supports this assumption.

III.G.2.3 Cumulative Actions Considered

Impacts on recreational resources within this segment of the Upper Truckee River will cause users to identify other recreation areas within the South Lake Tahoe area. However, informal recreation surveys and the lack of formal recreation facilities support the assumption that recreational use within the project area is mostly by local residents. Therefore, for the purposes of this assessment only those projects affecting recreation usage within the South Lake Tahoe area are considered.

III.G.2.3.1 Existing Recreation Programs

Several ongoing programs, such as Tahoe Regional Planning Agency's Environmental Improvement Program and U.S. Forest Service's (USFS) Trail Access and Travel Management Plan (ATM) are being implemented to improve recreation facilities and the overall quality of recreation. The TRPA EIP is an integrated improvement program intended to accelerate achievement of environmental threshold carrying capacities (ETCC) established for the Lake Tahoe Region. The EIP program identifies increased recreational facilities and an increase in quality at various recreational facilities throughout the Lake Tahoe Basin.

The USFS ATM is aimed at upgrading existing trails, reducing impacts to resources, and improving the overall recreational experience on Forest Service trails. This plan is currently in the development stage.

Also, the California Tahoe Conservancy is conducting work on recreation facilities at its Sunset Ranch. This work includes remedial project activities such as closing trails and trail realignment. Currently there is no formal recreation plan for conducting work on the Sunset Ranch.

III.G.3 Affected Environment

III.G.3.1 Area of Influence

The Lake Tahoe Region is a significant resource for recreational users. These users primarily originate within the state of California (67% according to a TRPA survey) and look to participate in a wide variety of activities from beach activities, hiking, boating, rafting/kayaking, camping, and winter activities such as skiing to shopping, and gaming. Recreation activities within the Lake Tahoe Region provide a significant source of revenue.

Examples of recreation facilities within the Tahoe Basin include Lake Tahoe itself and other smaller lakes, numerous rivers and streams, national forests, designated wilderness areas, public and private campgrounds, ski resorts, and casinos.

III.G.3.2 Existing Conditions

III.G.3.2.1 Sunset Ranch

Recreational facilities on the Sunset Ranch along Reach 6 of the Upper Truckee River Restoration Project consist of trails paralleling the river and across adjacent meadow areas. The trails within the Sunset Ranch appear to receive little use during the weekdays and weekends. Typical recreational activities include hiking, dog walking, and mountain biking. There is also rafting and/or swimming activities along several sand bars and the potential for fishing within the river.

III.G.3.2.2 Airport Reach

Recreation facilities along the airport reach (Reaches 3, 4, and 5) consist of well-established trails emerging from the nearby residential neighborhoods and paralleling the river. These trails appear to receive moderate use by locals during both the weekdays and weekends. Typical recreational activities include, hiking, dog walking, and mountain biking. There is also rafting and/or swimming activities along several sand bars and the potential for fishing within the river.

III.G.3.2.3 Ledbetter Meadow

The Ledbetter Meadow is on fenced private property and there was no evidence of recreational use during a site visit conducted on June 26, 2002. Hiking and biking trails have not been established on this property; however, several roads may provide recreational access to the property. Past observations have shown that the meadow does offer picnicking opportunities to local residents.

III.G.4 Environmental Consequences

III.G.4.1 Anticipated Impacts

Effects to recreation are considered significant if:

- The project would increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; and/or
- The project includes recreation facilities that require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment.

III.G.4.1.1 Proposed Alternative 1

Under the No-Action plan, there are no immediate plans for developing additional formal recreational facilities or enhancing the quality of existing informal facilities. Recreational usage and access would remain unchanged. Also the quality of recreation would remain the same; therefore this alternative would not have any affect on recreation.

III.G.4.1.2 Proposed Alternative 2

During construction, this alternative will result in restricted access to the river due to construction activities such as bank enhancements, lowering the floodplain, and placing in channel structures. These construction activities will affect, in particular, fishing and rafting/boating activities. Trail dependent recreational activities (hiking, mountain biking, dog walking, etc.) will only be affected in Reaches 3, 5, & 6. These activities will only be impacted during the short-term construction period and may resume after construction has been completed. There are numerous additional recreational facilities adjacent to the project area located within the Lake Tahoe Basin Management Unit and further up-stream along the Upper Truckee River that could temporarily be used during construction instead of the facilities along this segment of the Upper Truckee River.

The overall quality of these recreational activities will also be impacted during construction and for a short duration after construction due to construction activities, construction noise, and the short-term removal of vegetation along portions of the river. However, with the re-establishment of vegetation and the increased quality of fish habitat due to in-stream structures the post-project quality of recreation will be increased.

The overall affect on recreation is less-than-significant because:

1. nearby alternative recreational facilities can be used during construction without causing any additional physical deterioration;
2. this project does not include plans for additional recreational facilities; and
3. the increased quality of recreation post-project.

III.G.4.1.3 Proposed Alternative 3

During construction, this alternative will also result in restricted access to the river, thereby affecting, in particular, fishing and rafting/boating activities. Trail dependent recreational activities (hiking, mountain biking, dog walking, etc.) will only be affected in Reaches 3, 5, & 6. These activities will only be impacted during the short-term construction period and may resume after construction has been completed. There are numerous additional recreational facilities adjacent to the project area located within the Lake Tahoe Basin Management Unit and further up-stream along the Upper Truckee River that could temporarily be used during construction instead of the facilities along this segment of the Upper Truckee River.

The overall quality of these recreational activities will also be impacted during construction and for a short duration after construction due to construction activities, construction noise, and the short-term removal of vegetation along portions of the river. However, with the re-establishment of vegetation and the increased quality of fish habitat due to in-stream structures the post-project quality of recreation will be increased.

The overall affect on recreation is less-than-significant because:

1. nearby alternative recreational facilities can be used during construction without causing any additional physical deterioration;
2. this project does not include plans for additional recreational facilities; and
3. the increased quality of recreation post-project.

III.G.4.2 Unavoidable Adverse Impacts

Since project Alternatives 2 and 3 would involve construction activities necessary to restore the Upper Truckee River, certain short-term adverse impacts on recreational usage and quality are unavoidable. However, project Alternatives 2 and 3 will restore the riparian ecosystem resulting in a more natural stream environment. This will likely improve the quality of recreational usage through improved fishing due to enhanced fish habitat and a more natural setting for recreational users to enjoy.

III.G.4.3 Proposed Mitigation

Proposed mitigation for this project includes:

1. avoiding construction activities, where possible, near established trails within the area in order to reduce impacts to these facilities, and
2. the return to pre-project condition or better of any recreational facilities that are affected by construction.

III.H AIR QUALITY/ ATMOSPHERIC RESOURCES

III.H.1 Issues

Aside from obvious health issues, air quality has special significance in Tahoe because atmospheric deposition is considered one of the largest contributors of nutrients and fine particulates to Lake Tahoe. These pollutants are being blamed, in part, for the Lake's accelerated loss of water clarity. Any alternative, other than No Action, will result in a temporary increase in air pollution that has potential to negatively impact Lake Tahoe.

III.H.2 Analysis Methods and Assumptions

III.H.2.1 Impact Analysis Methods

In order to estimate project-related emissions, the following calculations were made:

1. Estimate exhaust emissions related to off-road construction equipment. Off-road construction equipment necessary to complete the project was inventoried. For each type of equipment, total hours required for project completion were estimated. The total number of hours was multiplied by the average horsepower, load factor, and emission factor to determine the amount of total pollutants (CARB, 2001).
2. Estimate exhaust emissions related to on-road vehicle emissions. On-road vehicle emissions, including haul trips to/from borrow sites were estimated. The total emissions were estimated by multiplying the total miles traveled by an emission factor. The emission factors were obtained by running the EMFAC2000 Model (CARB, 2001). The EMFAC2000 Model calculates emissions by vehicle type (i.e. heavy duty diesel truck) and incorporates pollutants from exhaust due to running, idling, and starting the vehicle.
3. Estimate fugitive dust from construction site. The acreages of the construction areas, including borrow sites and staging areas, were estimated. The acreages of these sites were multiplied by an emission factor (MRI, 1996) to obtain fugitive dust emissions.
4. Estimate fugitive dust from vehicles traveling on paved roads. Road surface silt loading and an average vehicle weight were estimated and entered into an equation to determine lbs/VMT (Vehicle Mile Traveled). This number was multiplied by the total VMT of trucks traveling to/from borrow sites and workers traveling to/from the construction site to determine the fugitive dust (EPA, 2001; Gaffney and Shimp, 1997).

III.H.2.2 Assumptions

1. Construction at the site would occur over the course of approximately 6 months or 125 days.

2. Excess soil would be hauled to a site that is approximately 30 miles roundtrip from the construction site.
3. Construction equipment required includes: excavators, backhoes/loaders, scrapers, compactors, and water trucks.
4. Total construction area is approximately between 22-35 acres (depending on alternative), only 20% would have construction activity at any given time.
5. Worker vehicles would travel on average, 100 miles roundtrip/day.

III.H.2.3 Cumulative Actions Considered

To the extent that multiple projects are constructed simultaneously, there could be additional increases in pollutant emissions. Fugitive dust and Nitrogen oxides (NO_x) emissions are the primary concerns for this project. Other construction projects located in close proximity to this stretch of river during construction (within approximately one mile radius) could produce a cumulative impact for fugitive dust emissions. Additional construction projects could also contribute to, and potentially cause an exceedence of pollutant thresholds. Pollutant thresholds for the Lake Tahoe basin are defined and discussed below.

III.H.3 Affected Environment

III.H.3.1 Area of Influence

The effects on air quality from project actions would temporarily affect the project site and approximately a one-quarter mile buffer radius around the site due to fugitive dust impacts. Due to the reaction time for the formation of ozone, the emission of ozone precursor pollutants, Reactive Organic Gasses (ROG) and NO_x, has the potential to affect an area further from the project site.

III.H.3.2 Existing Conditions

Responsibility for air quality regulations and management is shared by federal, state, regional, and local agencies. On a federal level, the U.S. Environmental Protection Agency (EPA), enforces the Clean Air Act, establishes national ambient air quality standards (AAQS), and regulates major emissions sources. Within the Clean Air Act are the conformity provisions. These provisions were put in place to ensure that Federal agencies would contribute to the efforts of attaining the national AAQS. The EPA has issued two conformity guidelines: transportation conformity rules which apply to transportation plans and projects, and general conformity rules which apply to all other Federal actions. Conformity determination is only required for the alternative that is ultimately approved and funded. A project that produces emissions that exceed standards would be required to be mitigated. A project would be exempt from the conformity rule if the project-related emissions are less than the *de minimis* thresholds established by the conformity rule.

The California Air Resources Board (CARB) regulates air quality on a state level. CARB works with the air districts to achieve standards set by the EPA and establishes state AAQS that enforce goals outlined in the California Clean Air Act. On a regional level, air pollution control districts (APCD) or air quality management districts (AQMD), (the El Dorado County APCD has authority over the project area), have many responsibilities. These districts monitor air quality, establish permitting requirements, design programs to attain or continue to maintain state and federal AAQS, and enforce air quality standards through inspections, education, training, or fines. Tahoe Regional Planning Agency (TRPA) is a subset of this latter category. The TRPA acts as the lead air quality-planning agency in the Lake Tahoe area. Local agencies are the last group who share in the air quality management role. Their responsibilities include controlling or mitigating air pollution through land use decisions and local ordinances.

Pollutants for which a national standard has been established are termed "criteria" pollutants, because the standards are based on studies of health effects criteria that show a relationship between the pollutant concentration and its effect. From this relationship, acceptable concentration levels are also established. The criteria pollutants of primary concern (carbon monoxide, ozone, nitrogen oxides, and particulate matter) in the project area are described below.

The primary sources of carbon monoxide (CO) emissions are the combustion of hydrocarbon fuels by motor vehicles, as well as fireplaces, stoves, and furnaces. In the project area, the majority of CO emissions are from mobile sources. CO is regulated because of concern for public health. The EPA and California both have the same 8-hour average AAQS of 9 parts per million (ppm). TRPA's 8-hour standard is set at 6 ppm. Based on air quality data collected from 1996-2000, no CO standards were exceeded on any day.

Ozone can cause respiratory problems, especially for sensitive groups, as well as damage to vegetation. Ozone is a result of photochemical reactions involving hydrocarbon compounds and oxides of nitrogen (NO_x). During sunny days, especially during the summer, increased levels of ultraviolet radiation contribute to higher levels of ozone. Because ozone is a secondary pollutant (formed by other primary pollutants in the atmosphere), high concentrations of ozone can be found miles downwind of the source of the primary pollutants. Hydrocarbons and NO_x are emitted primarily from fossil fuel combustion, chemical processing, fuel storage and handling, and solvent usage. The EPA AAQS for ozone is 0.12 ppm, averaged over a one-hour period. The State has a stricter one-hour AAQS for ozone, set at 0.09 ppm. TRPA's one-hour ozone threshold shall not exceed 0.08 ppm. Currently, TRPA's 1-hour threshold standard for ozone is not in attainment in the Tahoe Region. The region is in attainment for the California and Federal ozone standards.

Particulate matter in the atmosphere results from many sources including fugitive dust, vehicle and residential combustion processes, and road abrasives and deicers. The El Dorado APCD has permit authority over stationary sources of air pollutants. There are currently no high emissions permitted facilities in the project area. Standards are in place to regulate the amount of inhalable particulate matter in the atmosphere that is smaller than 10 microns in diameter (PM_{10}). The EPA's 24-hour AAQS for PM_{10} is 150 μg/m3, and its annual average is 50 μg/m3. State standards are more stringent, set at 50 μg/m3 for the 24-hour AAQS and 30 μg/m3 as an average annual AAQS. There is no TRPA threshold for particulate matter measured in total mass. The region is in attainment for both Federal and California PM_{10} emission standards.

Visibility is affected by the amount of fine particulate matter less than 2.5 microns ($PM_{2.5}$) in the atmosphere. Fine sulfur aerosols and soils, ammonium nitrate, and smoke contribute to the concentrations of $PM_{2.5}$. Additionally, humidity is a factor in visibility; when relative humidity is above 70%, there is a significant decrease in the visual range. A decrease in visibility caused by a layer of haze results in a reduction in clarity, contrast, and color. This is of great concern especially for areas such as the Tahoe Basin, known to have such stunning scenery. TRPA's thresholds for air quality include visibility standards for both regional and sub-regional visibility. Regional visibility is defined as the overall visibility in the Lake Tahoe Basin. Sub-regional visibility is characterized by the visibility over an urbanized area, such as the south shore of Lake Tahoe. TRPA's regional thresholds for air quality are to achieve visual ranges as follows:

- 97 miles 50 percent of the time and,
- 71 miles 90 percent of the time.

TRPA's sub-regional thresholds for air quality are to achieve visual ranges as follows:

- 48 miles 50 percent of the time and,
- 19 miles 90 percent of the time.

The regional and sub-regional 50 percent visibility ranges and the 90 percent sub-regional visibility range are in attainment. The 90 percent regional visibility standard is not in attainment.
The project area is located in the Lake Tahoe Air Basin, which consists of the eastern portions of Placer and El Dorado Counties. CARB monitors criteria pollutants at monitoring sites throughout the counties. Table III.H.1 lists the existing air quality conditions for ozone, PM_{10}, and carbon monoxide for El Dorado County.

III.H.3.2.1 3.21 Sensitive Receptors

Sensitive air receptors include people and facilities that are more susceptible to the effects of air pollution than are the general public. Examples of sensitive air receptors include health care facilities, rehabilitation centers, convalescent centers, residences, schools, playgrounds, child-care centers, and athletic facilities. Within the project area, residences are the primary sensitive receptor. There is also a hospital located less than ½ mile from the project area.

Table III.H.1 Ambient Air Quality Summary

Pollutant	Averaging Time	TRPA Thresholds	Maximum Concentrations				
			1996	1997	1998	1999	2000
Ozone (ppm)	1-Hour	.08	0.083	0.095	0.081	0.095	.089
	8-Hour	.08	0.073	0.071	0.077	0.079	.077
PM_{10} (ug/m_3)	24-Hour	50	72	55	59	41	50
	Annual Geometric Mean	30	N/A	19.6	19.6	17.4	17.6
Carbon Monoxide (ppm)	1-Hour	20.0	10.4	7.7	7.5	3.2	16.1
	8-Hour	6.0	5.1	3.8	4.3	2.4	2.8

III.H.3.2.2 Climate, Meteorology and Topography

As discussed briefly above, relative humidity influences visibility. It is important to note the local and regional weather patterns as they can also influence the effects of pollutant concentrations. The project area is characterized by winters that produce large amounts of precipitation in the form of snow, temperatures below freezing, as well as wind, cloudiness, and lake and valley fog. In between storms, the days can be cool, bright and sunny. Inversion layers, where warm air overlays cooler air and traps pollutants close to the ground occur periodically. In the winter, this can lead to CO “hotspots” in the more congested/populated areas of the basin, such as South Lake Tahoe. Summers in the project area are mostly sunny with temperatures reaching the upper 70s and low 80s. During the summer, increased sunshine contributes to the photochemical reaction between reactive organic compounds and nitrogen oxides that produces ozone.

The project area is in a relatively flat portion of the basin, bordered by the Sierra Nevada Mountains to the west and the Carson Range to the east. The close proximity of the Sierra Nevada to the basin contributes to pollutant transport from the Sacramento Valley by mountain upslope winds. This transport occurs when the western side of the Sierra Nevada is warmed causing the air to rise upwards and over the mountains to then cool and sink into the basin.

III.H.4 **Environmental Consequences**

Effects on air quality are considered significant if the project would cause or contribute to any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan.

- Violate any air quality standard or contribute to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).
- Expose the public (especially schools, day care centers, hospitals, retirement homes, convalescence facilities, and residences) located within one-quarter mile from the construction area to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

Significance criteria developed by the El Dorado APCD and conformity thresholds established by the EPA were used to determine the significance of project-related air quality effects. Project-related emissions were considered significant if NO_x or ROG exceeded 82 lbs/day. Conformity thresholds are not set for criteria pollutants in El Dorado County because the County is considered in attainment for those pollutants.

Emissions associated with each alternative would primarily be the short-term direct effects from construction. Emissions include exhaust from construction equipment, fugitive dust from construction activities, and exhaust from construction vehicles traveling to and from borrow or fill sites. Emissions for each of these activities were estimated as described in Section 2.1– Impact Analysis Methods.

III.H.5 Environmentla Impacts

III.H.5.1 Anticipated Impacts

III.H.5.1.1 Proposed Alternative 1 – No Action

The No Action Alternative would not generate any construction-related emissions. Air quality in the project area would continue to be affected by local pollutant emissions and could experience a potential increase in emissions as the population grows. However, stricter air quality standards implemented by the El Dorado APCD, the TRPA, and CARB may aid in improving current conditions and may help in avoiding future rises in emissions.

III.H.5.1.2 Proposed Alternative 2 – Moderate Enhancement Plan

Alternative 2 would not have any long-term effects on air quality. However, construction would result in two types of short-term effects on air quality. These direct effects are combustion emissions and dust emissions. Table III.H.2 summarizes the estimated emissions in lbs/day for the project.

Table III.H.2 Estimated Emissions due to Construction under Alternative 2.

Emissions - Unmitigated (lbs/day) - Full Enhancement Plan								
Pollutant	Offroad Construction	+	Onroad Construction Vehicles	+	Worker Vehicle Trips	=	Total	APCD Threshold
Combustion Emissions								
ROG	9.9		1.2		0.8		11.9	82
CO	49.1		4.2		18.6		71.9	N/A
NO_x	121.2		23.9		1.6		146.7	82
PM_{10}	3.7		0.6		0.2		4.5	N/A
Fugitive Dust	52.8		4.9		0.2		57.9	N/A

Estimated short-term construction-related emissions for NO_x of 130 lbs/day would exceed the 82 lbs/day significance threshold established by the El Dorado APCD. ROG emissions of 9 lbs/day would not exceed the 82 lbs/day threshold. There are no thresholds for PM_{10}, fugitive dust, or CO measured in total mass.

The sensitive receptors located near construction projects may experience adverse effects due to increased dust emissions. Along the project site, sensitive receptors are located in reaches 1, 5, and 6. An average of 80 lbs/day of fugitive dust emissions is estimated to be produced due to construction emissions. A dust suppression plan as outlined under Section 4.3 would reduce dust emissions approximately 60 percent.

Restoration of reaches 1 through 6 of the Middle Truckee River is not likely to produce any changes or increases in odors to existing conditions for the surrounding sensitive receptors.

The overall effect on air quality, due to construction of the Moderate Enhancement Plan, would be significant due to the exceedence of the NO_x significance threshold.

III.H.5.1.3 Proposed Alternative 3 – Full Enhancement Plan

Alternative 3would not have any long-term effects on air quality. However, construction would result in two types of short-term effects on air quality. These direct effects are combustion emissions and dust emissions. Table III.H.3 summarizes the estimated emissions in lbs/day for the project.

Table III.H.3 Estimated Emissions due to Construction under Alternative 3.

Emissions - Unmitigated (lbs/day) - Moderate Enhancement Plan								
Pollutant	Offroad Construction	+	Onroad Construction Vehicles	+	Worker Vehicle Trips	=	Total	APCD Threshold
Combustion Emissions								
ROG	4.6		4.2		0.6		9.4	82
CO	25.5		15.6		14.6		55.7	N/A
NO_x	41.1		88.5		1.2		130.8	82
PM_{10}	1.7		2.0		0.2		3.9	N/A
Fugitive Dust	61.6		18.3		0.2		80.1	N/A

Estimated short-term construction-related emissions for NO_x of 146 lbs/day would exceed the 82 lbs/day significance threshold established by the El Dorado APCD. ROG emissions of 11 lbs/day would not exceed the 82 lbs/day threshold. There are no thresholds for PM_{10}, fugitive dust, or CO measured in total mass.

The sensitive receptors located near construction projects may experience adverse effects due to increased dust emissions. Along the project site, sensitive receptors are located in reaches 1, 5, and 6. An average of 58 lbs/day is estimated to be emitted due to construction activities. A dust suppression plan as outlined under Section 4.3 would reduce dust emissions approximately 60 percent.

Restoration of reaches 1 through 6 of the Middle Truckee River would not produce any changes or increases in odors to existing conditions for the surrounding sensitive receptors.

The overall effect on air quality, due to the construction of the Full Enhancement Plan, would be significant due to the exceedance of the NO_x significance threshold.

III.H.5.1.4 Most Likely Alternative

Due to potential construction constraints in one or more of the reaches, a mixture of the alternatives is a possibility. The “Most Likely Alternative” would include the restoration efforts outlined in the Moderate Enhancement Plan for reaches 1,2,3,4, and 6,and the Full Enhancement Plan for reach 5. Since this mixture of alternatives would alter the quantity of soil moved at the site as well as the numbers and types of construction equipment, the total pollutants emitted for this alternative was analyzed as well. Other factors that are related to the significance criteria such as potential creation of odors and exposure of sensitive receptors to fugitive dust have been previously discussed in the Full and Moderate Enhancement Plans. These effects would not change with construction of the Most Likely Alternative and are therefore not presented in this section.

As is the case for the Moderate and Full Enhancement Plans, the air quality impacts would be short-term, resulting only from construction activities. Table III.H.4 outlines the quantities of pollutants emitted as a result of different elements of construction.

NO_x emissions decrease with the Most Likely Alternative as compared to the Moderate and Full Enhancement Plans. However, 101 lbs/day still exceeds the El Dorado APCD threshold. ROG emissions are well below the threshold, as were the ROG emissions for the Moderate and Full Enhancement Plans.

Table III.H.4 Pollutant Quantities Emitted as a Result of Different Construction Elements.

Emissions - Unmitigated (lbs/day) - Most Likely								
Pollutant	Offroad Construction	+	Onroad Construction Vehicles	+	Worker Vehicle Trips	=	Total	APCD Threshold
Combustion Emissions								
ROG	5.1		2.1		0.6		7.8	82
CO	26.7		7.8		15.2		49.7	N/A
NO_x	55.6		44.3		1.2		101.1	82
PM_{10}	1.9		1.0		0.2		3.1	N/A
Fugitive Dust	38.7		9.3		0.2		48.2	N/A

III.H.5.2 Unavoidable Adverse Impacts

Due to construction, short-term NO_x emissions would exceed air quality standards therefore creating a temporary significant effect that could not be mitigated to less-than-significant levels.

III.H.5.3 Proposed Mitigation

The following mitigation measures would be used to reduce the construction-related air quality effects:

- Prepare and implement a dust suppression plan.
- Incorporate NOx mitigation measures into construction plans and specifications.

III.H.5.3.1 Prepare and Implement a Dust Suppression Plan

A dust suppression plan would be submitted to the El Dorado APCD for review before initiating construction activities. The plan would include as many of the following mitigation measures as are applicable to each project site:

- All construction areas, unpaved access roads, and staging areas would be watered as needed during dry soil conditions, or soil stabilizers would be applied.
- All trucks hauling soil or other loose material would be covered or have at least 2 feet of freeboard. Wherever possible, construction vehicles would use paved roads to access the construction site.
- Vehicle speeds would be limited to 15 mph on unpaved roads and construction areas, or as required to control dust.
- Streets would be cleaned daily if visible soil material is carried onto adjacent public streets. A vacuum sweeper would be used to contain the runoff and dust.
- Soil stabilizers would be applied daily to inactive construction areas as needed.
- Exposed stockpiles of soil and other excavated materials would be enclosed, covered, watered twice daily, or applied with soil binders as needed.

- Vegetation would be replanted in disturbed areas as quickly as possible following the completion of construction.

III.H.5.3.2 Incorporate NOx mitigation measures into construction plans and specifications

- Use Caterpillar prechamber diesel engines (or equivalent) together with proper maintenance and operation.
- Use electric equipment, where feasible.
- Maintain equipment in tune with manufacturers' specifications.
- Use gasoline-powered equipment installed with catalytic converters.
- Substitute gasoline-powered for diesel-powered equipment, where feasible.
- Use compressed natural gas or onsite propane mobile equipment instead of diesel-powered equipment, where feasible.
- If the mitigation measures are implemented, dust-related PM_{10} emissions would be reduced by 60 percent (SCAQMD, 1992), and NO_x emissions would be reduced by 5 percent. Even with these mitigation measures, the project would still exceed El Dorado APCD significance thresholds for NO_x.

III.I VISUAL RESOURCES

III.I.1 Issues

The proposed project does not present any major issues with regards to visual resources.

III.I.2 Analysis Methods and Assumptions

III.I.2.1 Impact Analysis Methods

The quality of the visual characteristics of a particular site is dependent upon its usage making the impacts determination subject to an individual's visual reference. For example, the visual reference at a project site located in a developed commercial area would be vastly different then the visual reference at a pristine natural area. For this project a field visit was conducted to determine the existing usages, existing conditions, and the quality of these conditions based on established beliefs of what the visual quality should be for this site. From the standpoint of visual resources (e.g., the landscape along the project site), the primary existing usages are recreational (e.g., hiking, fishing, rafting, swimming), the airport, and cattle grazing. A natural visual setting, which is the site's current condition, is often important to such recreational activities as hiking, dog walking, and nature watching.

The primary agency responsible for the environment in the Lake Tahoe Basin is the Tahoe Regional Planning Agency (TRPA). A literature search of their planning documents (i.e. the Tahoe Regional Planning Agency's Environmental Threshold Carrying Capacity and Environmental Improvement Program documents) was conducted to determine if existing assumptions of site's visual quality already exist. According to the TRPA Regional Plan for the Lake Tahoe Basin (Scenic Quality Improvement Program and Technical Appendices, 1989), views from Highway 50 onto the Upper Truckee River are "acceptable" given the surrounding urban encroachment. This TRPA visual rating of "acceptable", which corresponds with the findings in the field, will be used as the baseline visual rating.

Last, an assessment of post-project conditions compared to pre-project conditions was made to determine if there were any substantial changes to the intended usage and related visual quality of the site, changing the current rating of "acceptable" to "unacceptable".

III.I.2.2 Assumptions

No assumptions were necessary for determining impacts to visual resources.

III.I.2.3 Cumulative Actions Considered

Cumulative impacts take into account past, present, and reasonably foreseeable future projects that might have an impact on the various resources being considered, A past project that has greatly affected visual resources along this segment of the Upper Truckee River is the development of the Lake Tahoe Airport. Also to be considered within cumulative impacts is the installation of the sewer pipeline paralleling portions of the river in Reaches 5 and 6.

There are currently no on-going projects that need to be considered in a cumulative impacts analysis.

There are also currently no reasonably foreseeable future projects proposed for this segment of the Upper Truckee River that may affect visual resources.

III.I.3 Affected Environment

III.I.3.1 Area of Influence

This section describes the visual area that could potentially be affected by the project. This visual area for the Upper Truckee River consists of portions of the town of South Lake Tahoe and the Stream Environment Zone (SEZ), or the natural marsh and meadowlands, river, and associated floodplain. This includes the floodplain in all 6 reaches and the meadows within Reaches 6, 5, & 1. Figure III.I.1 shows the Upper Truckee River SEZ for this project.

III.I.3.2 Existing Conditions

III.I.3.2.1 Town Landscapes

Within the Area of Influence, the town exhibits residential, urban including heavy commercial strip development, and industrial visual characteristics, including the Lake Tahoe Airport runways, terminal, and hangar structures.

III.I.3.2.2 Surrounding Landscapes

The Lake Tahoe Basin setting is typically natural with mid- and long-distance views of mountain ridges, views of forests, and views of Lake Tahoe. The scenic quality of the surrounding landscapes is considered to be very high.

III.I.3.2.3 Views from Upper Slopes onto the Project Site

The Upper Slopes surrounding the project site contain residential neighborhoods and portions of the El Dorado National Forest. Existing dense forested conditions typically shield views from these areas onto the project site completely obscuring views of the Upper Truckee River. The exception is along Reach 1 where numerous residences are located close to the river channel and have an unobscured view of the river and associated meadow.

The other exceptions are along Highway 50 at three locations, at the Elks Club Bridge, along the northern half of the airport, and at the Highway 50 in South Lake Tahoe Bridge. These locations provide glimpses of the Upper Truckee River from the highway. The views are typically brief, and consist of riparian and meadow landscapes.

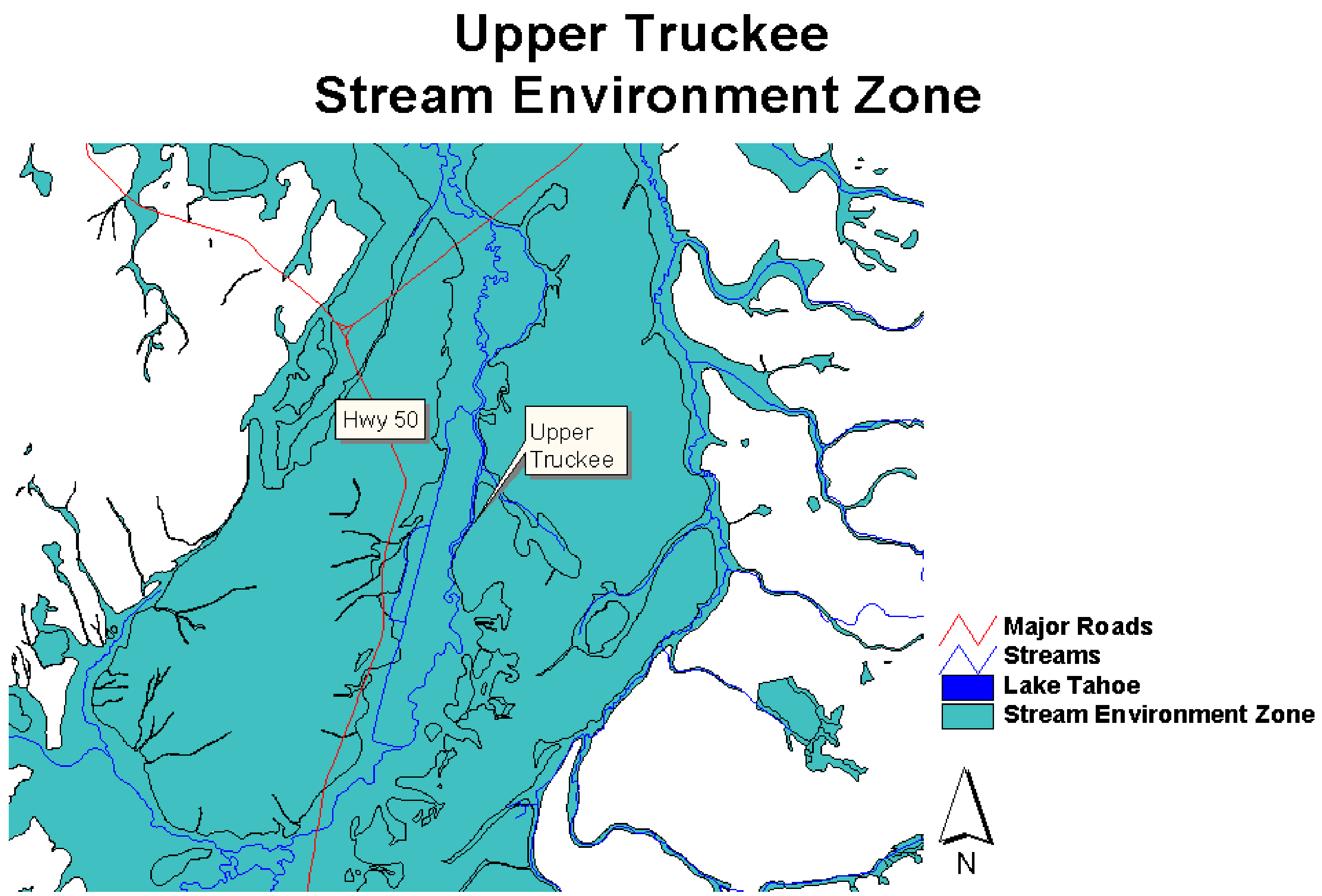


Figure III.I.1: Upper Truckee River Stream Environment Zone

III.I.3.2.4 Views from the Project Site

Visual resources from the vantage point of the project site were assessed during the field visits and using photo monitoring data collected by Integrated Environmental Design (IED). IED conducted an intensive photo monitoring effort in order to document pre-restoration site conditions along the river. Eight photo-monitoring stations were set up and photos taken to document pre-project conditions so that changes to the project area could be visually assessed. Each photo point has a GPS coordinate, and a T-stake has been placed in the field to physically mark the location. These photos can be found in the 2002 Upper Truckee River Monitoring.

The views from the project site consist primarily of a natural visual setting of the river, riparian areas along the banks, and associated floodplain meadows bordered by forest. However, in several places development has encroached upon this natural setting. Along the southern portions of Reach 6 there is the Highway 50 crossing and the Elks Club building and parking lot. Along Reaches 5 and 6 are numerous signs and manholes indicating the sewer line that crosses the meadow to the east of the river. Reaches 2 through 5 include the visual presence of the Lake Tahoe Airport to the west of the river. Reach 1 is currently used for cattle grazing and includes views of fences and sheds associated with this type of activity.

III.I.4 Environmental Consequences

Effects on visual resources are considered significant if the project would:

- Have a substantial adverse effect on a scenic vista.
- Substantially degrade the existing visual character or quality of a site and its surroundings.

III.I.4.1 Anticipated Impacts

III.I.4.1.1 Proposed Alternative 1

For the No-Action existing conditions will not change; therefore, this alternative will have no effect on visual resources within the area.

III.I.4.1.2 Proposed Alternative 2

Implementation of Alternative 2 will require construction activities and equipment for approximately 6 months in order to conduct restoration activities. This will temporarily detract from the visual character of the site from a natural one to a construction one. However, the long-term goal of the project is to restore the Upper Truckee River to a more natural state. Restoration will include, not only work on the channel itself, but also to replant native species and re-establish meadow, riparian, and other natural vegetation. For this reason, Alternative 2 should result in a qualitative improvement in the visual quality of the site as site conditions are returned to a more natural state by restoring and enhancing a damaged natural resource.

III.I.4.1.3 Proposed Alternative 3

Implementation of Alternative 3 will also require construction activities and equipment for approximately 6 months in order to conduct restoration activities. This will detract from the visual character of the site from a natural one to a construction one. Again, the long-term goal of the project is to restore the Upper Truckee River to a more natural state. Restoration will include, not only work on the channel itself, but also work to replant native species and re-establish meadow, riparian, and other natural vegetation. For this reason, Alternative 3 is expected to improve the visual quality of the site as site conditions are returned to a more natural state by restoring and enhancing a damaged natural resource.

III.I.4.1.4 Summary of Impacts

The project will have a positive affect cumulatively when considering other projects within the area. The project will reverse negative impacts to visual resources due to alterations of the river channel when the airport runways were constructed and alterations to the channel when it was realigned in the Ledbetter Meadow for cattle grazing purposes.

III.I.4.2 Unavoidable Adverse Impacts

[None]

III.I.4.3 Proposed Mitigation

Construction screening can be used to mitigate for visual impacts due to construction activities. Restoration activities such as planting native vegetation will serve to mitigate for any visual impacts created by the project. Sloping, grading, and general landscape architecture will also help mitigate these project visual impacts.

III.J CULTURAL AND HISTORIC RESOURCES

III.J.1 Issues

III.J.1.1 Project Background

The Upper Truckee River corridor has been significantly disturbed by human land altering activities beginning with the initial manipulation of the environment by early Native Americans. Subsequent Euroamerican logging, grazing, the prolonged suppression of fire, and contemporary urban development and recreation have affected the stability and condition of river reaches and wetlands. Saw logs were floated down the Upper Truckee and banked at the outlet behind piling barricades, awaiting transport to the Comstock-era lumber mills at Glenbrook. Stock grazed the Upper Truckee River bottomlands, supplying feed for the Comstock freighting teams and dairy products to the traveler. Grazing has continued on private land and wetlands and meadows have experienced rapid change. Since 1900 approximately 75 percent of marshes and 50 percent of meadows have been degraded, with around 25 percent of the basin's marshlands being developed between 1969 and 1979 (Elliott-Fisk et al., 1996). Major impacts to the Upper Truckee River marsh commenced in 1959, when 2,000 feet of the lower river were straightened to accommodate residential development at Tahoe Keys and the river's middle reach was altered to expand the Lake Tahoe Airport. Changes in the location and configuration of the Upper Truckee River are graphically depicted on historic maps and photographs (plates III.J.2 through III.J.5; figures III.J.3 through III.J.14).

Efforts to mitigate its compromised hydrologic function were initiated by the California Tahoe Conservancy (CTC) in 1997 along the lower reach of the Upper Truckee River as part of the "Upper Truckee River and Wetland Restoration Project" (Lindström 1997). This study of the river's middle reach forms a companion piece to that initial research, with a subsequent restoration effort planned in the upper reaches of the Upper Truckee to follow.

Historic human modifications of the Upper Truckee River channel have impaired the natural hydrologic function of the marsh, reduced wetland areas, and modified channel morphology in a manner that has reduced aquatic habitat quality and created abundant pollutant sources. The cumulative result has been the compromise of the Upper Truckee's natural filtering system and a decline in the ecosystem's overall health. Sections of the Upper Truckee River channel have eroded into the valley floor up to four feet in response to these historical changes. Some areas have been filled to accommodate uses such as the South Lake Tahoe Airport, while other areas have been ditched and bermed to control irrigation on developed pastures.

A growing consensus suggests that the pre-Euroamerican condition of Tahoe's ecosystem is the desired future state (Elliott-Fisk et al., 1997). The objectives of this study are to provide an overall assessment of the area, develop and rank three alternatives for a river ecosystem restoration project, and provide a preliminary design report and conceptual plans for the preferred alternative for use in the NEPA/CEQA stage of the project. The key enhancement strategies are aimed to restore the function of the pre-disturbance channel without interfering with existing land use constraints. The construction phase of the project involves the reconstruction of several segments of the channel, stabilization of several eroding banks, and establishment of a greater diversity of fish and wildlife habitat. Measures include removal of fill, repair of eroding banks, revegetation of banks and floodplain areas, removal of and/or modification of old diversion dams, installation of boulders and logs within the channel, construction of new channel segments, and replacement of bridge crossings.

This project engages the input and review of regional, county, state, and federal agencies. As such, current environmental review policies must be in compliance with antiquities mandates and guidelines established by the Tahoe Regional Planning Agency (TRPA, Chapter 29), the California Environmental Quality Act (CEQA, Section 15064.5) and the National Environmental Policy Act (NEPA, Section 106 of the National Historic Preservation Act of 1966 as amended by 16 U.S.C. 470, Archaeological Resources Protection Act of 1979, and Procedures of the Advisory Council on Historic Preservation-36 CFR 800). All of these guidelines and mandates require that heritage resources be considered as part of the environmental assessment process.

III.J.1.2 Project Scope

In compliance with regional, state and federal regulations, a heritage resource study was performed. Heritage resource studies are customarily performed in a series of phases, each one building upon information gained from the prior study.

1. INVENTORY: First, as part of the initial phase, prefield research and archaeological field reconnaissance are conducted to inventory existing heritage resources and constraints. If properties are discovered and if they may be subject to project-related impacts, they should be formally recorded and their significance must ultimately be evaluated.

2. EVALUATION: Next, and pending the outcome of earlier work, heritage resources subject to project-related impacts may need to be evaluated to determine their significance. Potential impacts to these significant resources can then be specifically assessed and detailed recommendations to mitigate impacts can be proposed. If project redesign to avoid impacts is unfeasible, then mitigation measures must be developed and implemented in order to recover the significant information contained within these heritage properties prior to project ground disturbance activities.

3. IMPACT MITIGATION AND DATA RECOVERY: A final phase involves the implementation of mitigation measures recommended during the prior evaluation phase. Mitigation, or data recovery, typically involves additional field study, archaeological excavation, metal detection survey, archival research, photo documentation, mapping, etc.

- The subject of this report entails initial investigations, whose objectives are designed to identify key environmental opportunities and constraints. Findings satisfy requirements pertaining only to the initial inventory of heritage resources by conducting (1) a literature review and oral history interviews to determine the presence of known heritage properties, (2) an ethnographic study to identify potential Native American concerns, and (3) a field reconnaissance or "sweep" survey to locate existing heritage resources.

III.J.1.3 Heritage Values

Human beings have been a component of the Lake Tahoe ecosystem for at least 8000 to 9000 years. Efforts to restore the Upper Truckee River ecosystem benefit from an increased understanding of the long-term ecological dynamics between historic human communities, plant and animal communities and the physical environment. Within the Upper Truckee River corridor, human disturbances have ranged widely in scale, from Native American micro-burning a patch of native shrubs to Euroamerican clear-cutting thousands of acres of timberland and altering the course of the stream channel.

Paleoenvironmental, archaeological, ethnographic, and historic documentation offer great time depth and are used as independent and corroborative tools with which to link historic conditions to contemporary research, monitoring, and adaptive management. Heritage resources are uniquely tied to the human dimension of the regional ecosystem and may guide future decision-making by setting a baseline of reference conditions to determine how present conditions differ from past conditions, the reasons for that difference, and the sustainable conditions that may be possible in the future. Knowledge of how people shaped past ecosystems can then be directly applied to the restoration and maintenance of future ecosystems. Heritage resources require preservation, conservation and appropriate management. (See Lindström and Waechter, 1995 and 1996; Lindström and Hall, 1998; and Lindström et al., 2000 for detailed discussions regarding the human dimension of the Lake Tahoe Basin ecosystem.)

III.J.1.4 History

When conservatively interpreted, first-hand accounts from period observers provide a reliable view of the past, with observations on the characteristics of the pre-Euroamerican landscape. Other archival sources may contain quantitative data that are adequately precise to facilitate the identification of environmental reference conditions for specific areas (located by township/range/section) and times (by month and year). Historic deeds and assessors records document land transfers and may indicate the kind and intensity of land use. Comparisons of historic and contemporary photographs illustrate point-specific landscape changes and general environmental conditions.

III.J.1.5 Archaeology

In the absence of historical or oral history records beyond 150 years, the archaeological record offers information to address the question of potential environmental disturbances in the prehistoric past. Accordingly, archaeological remains are considered to be more than the evidence people left on the landscape; they are the expression of human interaction with the landscape. Wetlands, such as the Upper Truckee River, are viewed as both "habitat and artifact" (Forney, 1995), being a repository of information about the human-induced changes and their corresponding environmental conditions.

III.J.1.6 The Washoe Past and Present

Lake Tahoe, the center of Washoe aboriginal territory and focus of contemporary culture, was once the destination of hundreds of Washoe people returning each spring to reclaim family camping areas and favored fishing spots. By all accounts, the Upper Truckee numbered as one of the top three fisheries in the Lake Tahoe Basin, and most accounts rank it as the most important (Lindström, 1992 and 1996; Lindström et al., 2000).

Prior ethnographic research has not focused on traditional Washoe resource harvesting techniques or horticultural and conservation practices, topics of timely concern in present ecosystem restoration efforts. Yet, there is compelling evidence of extensive and systematic management. Future research along these lines holds promise for the disclosure of specific management and conservation practices that may have influenced the ecosystem of the Upper Truckee River sub-basin in the past and that may contribute to its future management.

Washoe people and their tribal government are eager to renew their ties to Lake Tahoe and to participate in the restoration and maintenance of a healthy watershed, inclusive of the human enterprise. In 1994 the Washoe Tribal Council developed a Comprehensive Land Use Plan that includes goals to reinstate ancestral land management practices at Lake Tahoe, including the harvest and care of traditional plant and animal resources (Washoe Tribal Council, 1994). In concert with this plan, the tribe is sponsoring an oral history program aimed at the identification of anthropogenically-altered landscapes resulting from traditional Washoe land use practices. As a key component, the program incorporates on-site visits and interviews with elders at traditional areas around Lake Tahoe. One objective of compiling this Washoe traditional knowledge is to promote management, including watershed restoration efforts that would favor biota targeted by contemporary Washoe people and engage Washoe plant specialists and land managers in active adaptive management strategies. Recognized as a sovereign nation, tribal overtures implore that the Washoe be considered serious stakeholders in land management issues at Tahoe.

III.J.2 Analysis Methods and Assumptions

III.J.2.1 Impact Analysis Methods

Heritage work for the Upper Truckee River restoration project was accomplished in two phases aimed at assessing project opportunities and constraints that will influence the selection of a preferred project alternative. Initial research was conducted to gather the necessary background data in order to assist project planners. Upon completion of background research, a field archaeological reconnaissance was performed to identify existing heritage resources within the project area.

III.J.2.1.1 Prefield Research

Baseline information on the paleoenvironment of the project area and prehistoric/Native American and historic/Euroamerican land use were analyzed in order to better identify the location, nature and intensity of environmental/cultural changes occurring within the project area, with a focus on past environmental conditions and prehistoric and historic alterations of the Upper Truckee River channel and its surrounding flood plain.

III.J.2.1.2 Background Research

Heritage research entailed a literature search of prehistoric and historic themes for the project area. This included a review of prior archaeological research and of pertinent published and unpublished sources. Heritage files maintained by the U.S. Forest Service (USFS), Lake Tahoe Basin Management Unit (LTBMU) and records maintained as part of the archaeological inventory at the North Central Information Center (NCIC) at California State University Sacramento (CSUS) were reviewed in order to identify any properties listed on national registers, state registers and other listings, including the files of the State Historic Preservation Office (SHPO). In addition to the official records and maps for archaeological sites and surveys in El Dorado County, the following historic references were also reviewed: the *Office of Historic Preservation Historic Property Directory* (HPD), the *National Register of Historic Places Listed Properties and Determinations of Eligibility* (updates), *California Historical Landmarks* (1996 plus updates), *California Points of Historical Interest* (1992 plus updates). Other local histories and secondary sources consulted are listed in the references cited section of this report.

Resources on file with the Lake Tahoe Historical Society (LTHS) were also searched. In addition to miscellaneous documents and photographs, an oral history of Alva Barton was reviewed and low-flight aerial photographs from the Mack Wardell Collection, the first director of the Lake Tahoe Airport, were examined.

Individuals knowledgeable in local history were contacted and focused oral history interviews were conducted as appropriate. LTHS members consulted include: Betty Mitchell, long-term resident and president LTHS, Lyn Landauer, historian and former president LTHS, and Del Laine, long term resident of the Upper Truckee River area and former mayor of South Lake Tahoe. Bill, Sr. and Melba (Barton/Ledbetter) Mosher, current owners of the Barton Ranch were interviewed by telephone at their winter ranch in Elks Grove, California. Melba Mosher is the great granddaughter of Hiram Barton, who first established the ranch along the Upper Truckee River in the 1860s. She is the granddaughter of W.D. Barton and daughter of Alva Barton's sister, Fay (Barton) Ledbetter. Melba spent most of her summers on that portion of the Barton Ranch that falls within the project area. Her husband, Bill, Sr. became directly involved in ranch activities at the lake in 1947. Although 96 years old, Alva Barton spends summers at the ranch house near the South Lake Tahoe Wye. Attempts to schedule a joint interview with Alva Barton and Melba Mosher were unsuccessful. Numerous family papers, deeds, and photographs are stored at the Barton ranch house at the lake. Other oral history information was drawn from prior interviews conducted by Lindström: (1) 1994 - Bill Ledbetter, grandson of W.D. Barton, nephew of Alva Barton and sister of Melba (Ledbetter) Mosher; (2) 1996 – Knox Johnson, member of pioneer ranching family that owned land at Trout Creek and Bijou Meadows, adjacent to the Bartons; (3) 1994 – Steve Smith, former owner of Sunset Ranch/Stables; (4) 1994 – Ron Mankins and Mark Regan – former staff of Sunset Ranch/Stables.

CTC files pertaining to the 'Sunset Ranch Acquisition' were reviewed at the South Lake Tahoe offices in the helpful company of Brian Wilkinson, CTC Watershed and Stream Restoration Coordinator. Bob Henderson, private attorney for the Sunset Ranch acquisition, and Phil Caterino of the American Land Conservancy, offered additional information.

Tim Oliver, a representative of the Tahoe Resource Conservation District (TRCD) and Jerry Owens and Chuck Taylor of the Nevada Resource Conservation Service (NRCS) opened their files and provided helpful project background and historical information. Tim Oliver supplied information on the history of the Lake Tahoe Airport.

III.J.2.1.3 Ethnography

Ethnographic research for this report was coordinated with other projects in the Lake Tahoe Basin, expanding the effectiveness of this effort. Research included reviews of personal field notes, transcripts from interviews conducted with 12 ethnographers (including Edgar E. Siskin) who worked in Washoe country during the 1930s (Rucks, 1999), and interviews with Washoe scholars, cultural specialists, and historians, including Warren d'Azevedo and Jo Ann Nevers. The following unpublished reports and field notes archived with Special Collections of the Getchell Library of the University of Nevada-Reno were reviewed: the Field Notes of Edgar E. Siskin (90-03); the Papers of George F. Wright (90-37); the National Science Foundation Graduate Field Training Project in Anthropology Collection (92-09); and the Washoe Indian Research Papers of Warren L. d'Azevedo (97-04; 99-14). Photographic indexes were also reviewed. Other archives inventoried include The History Project files of the Inter-tribal Council of Nevada (ITCN), and the papers of Jean Elizabeth Wier (MS/NC 17), both at the Nevada Historical Society, Reno. Their photographic indexes were also inventoried.

Mary Larson and other staff of University of Nevada Oral History Program (UNOHP) made the unedited transcripts from their Washoe Oral History Project (1992-1994) available; indexes to edited UNOHP oral histories, bound as research copies, were also searched for references to specific people and project area. These include oral histories of several Washoe individuals and other early residents of Lake Tahoe (e.g., Vernon, 1980).

Stephan James, interviewed September 19, 2002 at the Dresslerville Senior Center, provided valuable insights into the consequences of post-contact history and lost access to the Lake Tahoe fishery. Mr. James is part of a large family with well-documented associations to the project area and his contributions are gratefully acknowledged. Biographical notes made during this interview are attached as Appendix J-A.

In addition, the Cultural Coordinator for the Washoe Tribe of Nevada and California was contacted in order to incorporate tribal opinions, knowledge and sentiments into the planning process (see attached correspondence). Although no specific Native American concerns have been identified, project planning should be sensitive to traditional Native American values and on-going communication with the Washoe tribe is recommended. The Tribe has been notified of the results of this study and concurs with its findings.

III.J.2.1.4 Field Archaeological Reconnaissance

Prefield research provided the rationale with which to develop a strategy for the on-the-ground archaeological field reconnaissance. A pedestrian surface survey was structured by an "intensive" archaeological reconnaissance strategy. Consultations with the Upper Truckee River Project Manager (Tim Oliver, 2002) disclosed impact areas that were targeted for field examination. Approximately 250 acres of the 827-acre project area are subject to ground disturbance activities. Lindström and two assisting archaeologists (Lizzie Bennett and Charles Blanchard) walked this 250-acre area, employing parallel transects at no greater than 15-meter (50-foot) intervals. During this “sweep” survey, all heritage resources were briefly described and plotted on project maps (1”=100’ scale). Field recording of the heritage finds is deferred until a later time. Transect intervals and distances were established by pacing. Cardinal directions were maintained by compass readings. Ground surface visibility within the project area is variable. Overall, the ground surface is obscured by meadow grass, pine duff and riparian vegetation. Some of the area was inaccessible due to standing/flowing water and impenetrable vegetation. Archaeological survey coverage is shown on Figure III.J.15.

III.J.2.2 **Assumptions**

III.J.2.2.1 Previous Archaeological Investigations and Known Heritage Resources

Portions of the project area have been subject to an archaeological survey and several heritage resources studies have been done within or immediately adjacent to the project.
No known heritage sites have been recorded within the Upper Truckee project area.
One prior archaeological survey has been completed within the project area; Peters and Peak (1984) examined areas encompassing and adjoining the Lake Tahoe Airport. No heritage sites were encountered and a single isolated find consisting of two cobble milling hand stones was recorded near the south end of the airport runway and outside the Upper Truckee project area. Peters and Peak examined the entire reach of the river in Section 9 and the southern part of Section 4 down to the dam at the main fork in the river. Although Peters and Peak recorded no heritage resources within this reach, numerous finds were encountered during this Upper Truckee project survey.

Highway 50, bounds the project area on the north and south. Brown (1991) and Mainery (1989) evaluated the Highway 50 bridges at both ends of the Upper Truckee project area and found neither to qualify for listing on the National Register of Historic Places.

Areas adjoining the project area have been surveyed by Drews (1999), Lindström (1994), and O’Brien (1993).

Lindström (1994) surveyed 6.5 miles of proposed pipeline alignment as part of the South

Tahoe Public Utilities District plans to relocate a portion of the existing export pipeline that passes through the Upper Truckee River stream environment zone in the vicinity of the Lake Tahoe Airport. Her archaeological survey disclosed 15 heritage sites. These sites include: four prehistoric milling sites; two prehistoric sites containing both milling and flaked stone objects; the historic Lake House Road; an unnamed historic road; the W.D. Barton Dairy Ranch House -- also reported to be the Lyons Ranch House by Bill, Sr, and Melba Mosher, (2002); a Sunset Ranch/Stables equestrian facility; three pine marten traps; one historic habitation site and trash scatter; and one arborglyph carved on a pine snag. Isolated finds comprise: historic high-cut stumps; a wagon part and sparse trash scatter; a network of recent (?) dirt roads and trails; and a horse corral that may have been part of the Barton Dairy Ranch.

In 1999 Drews examined a large block of acreage surrounding the STPUD alignment in Section 9. In addition to resources recorded by Lindström, Drew recorded three refuse deposits, one refuse deposit on a prehistoric milling site, and two isolated historic artifacts.

The USFS-LTBMU has done a great deal of work on public land to the east, including one fuelwood sale (O’Brien 1993). The U.S. Forest Service also recorded two large and important prehistoric camps adjacent to the project area. One site consists of two bedrock mortar stations (one with five mortars and three shallow depressions, the other with five mortars), waste flakes, one projectile point, a concentration of river cobbles, and a possible midden. This site is also shown on the TRPA Historic Site Map (1984). Another site includes three bedrock milling features, accompanying hand stones, assorted flaked stone tools, and waste flakes.

Paleoenvironmental resources have been inventoried in the near shore zone at the outlet of the Upper Truckee River. Lindström observed at least 15 tree stumps, submerged in water up to seven feet deep in 1994. One wood sample, collected from the Upper Truckee River Delta at an elevation of 6222.9 feet, dates from 230+/- 60 years before present (BP). (The average surface elevation of Lake Tahoe is 6225 feet.) Two wood samples, collected from the adjoining Trout Creek Delta at elevations of 6218.9 and 6219.9 feet, date from 4590+/-60 BP and 4480+/-60BP (Lindström, 1994). Four other inundated tree stumps, located due east of the Trout Creek Delta and below Tahoe's natural sill level, date between 4900 and 5300 calibrated radiocarbon years before present (Lindström, 1990). All submerged stumps document lower lake levels that may reflect well-established regional droughts.

III.J.3 Affected Environment

III.J.3.1 Area 0f Influence

The project area of influence involves the ecological enhancement of the five-mile stretch of the Upper Truckee River in South Lake Tahoe between the lower Highway 50 crossing and the middle Highway 50 crossing near the Elk’s Club. The project area comprises about 837 acres, located in El Dorado County in Township 12 North, Range 18 East, sections 4, 9, 16, 20, and 21, M.D.M. (Emerald Bay and South Lake Tahoe U.S.G.S. 7.5 quadrangles).

Project topography is of low relief, encompassing the middle reach of the Upper Truckee River and its adjoining floodplain and ranging in elevation around 6240 feet. The Upper Truckee River is the largest tributary to Lake Tahoe. Six distinct reaches have been identified within the project limits for the purpose of addressing planning, design and impact analysis issues, and heritage resource findings.

III.J.3.2 Existing Conditions

III.J.3.2.1 Natural Setting

Captain James H. Simpson (1983:96) traveled through Lake Valley (presently known as South Lake Tahoe) on his way west in 1859.

> *June 13, Camp No. 38, Genoa*...The ride this morning the most charming I have had for a long while. Lake Valley is like a beautiful park, studded with large, stately pines. The glades between the trees are beautifully green, and the whole is enlivened by a pure, babbling mountain-stream, the most southern and principal branch of the Truckee, coursing along northwardly to its expansion, Lake Bigler [Lake Tahoe]. The pines of various kinds are very large, and attain a height of probably from 100 to 500 feet. Their diameter is not infrequently as much as 8 feet, and they sometimes attain the dimension of 10 feet. Just before we reached the mail-station, noticed a splendid waterfall or cascade, a tributary of the Truckee, tumbling into the valley from the west range. Saw in the valley a large herd of cattle and hogs, all looking finely. Indeed, I never have seen more sleek, saucy-looking cattle anywhere.

Simpson's route likely passed through the corridor marked by the middle reach of the present-day Upper Truckee River Reclamation Project and his observations provide interesting historical perspective in terms of Lake Valley's changing landscape. Ecosystems in the Lake Tahoe Basin have evolved with human disturbances. Here, as elsewhere in the Tahoe Basin, the environment affected the course of human activities and, in turn, human activities modified the environment. It is doubtful that modern plant and animal communities as reported by Storer and Usinger (1971) closely resemble their pristine composition due to historic and modern disturbance involving historic logging and grazing activities, and more recent residential/commercial development. During prehistoric times the area is thought to have supported a luxuriant growth of native bunch grasses, which allowed an abundant large game population and provided a nutritious source of seeds for use by early peoples. Lake Tahoe and its main tributary, the Upper Truckee River, was once considered a prime fishery of prehistoric Washoe and historic Euroamerican residents. The scarcity of fish observed during the current project field survey stands in sharp contrast to a once thriving fishery, as indicated by maps sketched by Washoe George Snooks in 1937 depicting a number of good spawning beds and aboriginal fish trap locales (Figure III.J.1).

Changes in the location and configuration of the Upper Truckee River are graphically depicted on historic maps and photographs. Maps dating from 1865 (Figure III.J.3), 1874 (Figure III.J.4) and 1887 (Figure III.J.5), although schematic, consistently show a middle reach that is fairly straight on a north-south trend, with the exception of a slight bend to the east in the upper part of Section 16 and lower part of Section 9. A pronounced bend in the river is indicated on an 1889 topographic map (Figure III.J.6), with a return to a straighter pattern on the 1895 map (Figure III.J.7), 1908 map (Figure III.J.8), 1914 map (Figure III.J.9), and 1926 map (Figure III.J.10). Multiple channels appear on maps beginning in 1949 (Figure III.J.11), 1956 (Figure III.J.12), 1959 (Figure III.J.13), 1961 (Figure III.J.14), and up until the present time. The river course is shown on plates III.J.1 and III.J.2, prior to its modification by airport runway expansion in 1963. The Upper Truckee River channel and adjoining meadowlands in sections 4 and 9 are depicted on Plate III.J.4 during runway expansion construction activities. Plate III.J.5 shows the modified channel soon after completion of the runway and prior to the construction of homes at Tahoe Keys.

Paleoenvironment

Changing aspects of the natural environment, which were of special importance to human populations inhabiting the Tahoe Sierra during the last 9000 years, are summarized in Lindström et al. (2000, 2002). Although paleoecological reconstructions are currently incomplete, the scientific record provides compelling evidence of dramatic climate change and associated ecosystem change over the last 10,000 years.

One very important avenue of paleoenvironmental study that is used to track the climatic and hydrologic histories of the Tahoe Basin is present near the mouth of the Upper Truckee River. Here, tree stumps submerged in up to seven feet of water are testimony that the surface elevation of Lake Tahoe has stood considerably lower than the present for long periods of time and may indicate periods of large-scale drought dating around 200 years ago and around 4500 to 5300 years ago (Lindström 1990, 1994, 1997). Supporting evidence of Tahoe's substantially lower lake levels also comes from drowned prehistoric archaeological milling features and additional stumps submerged up to 16 feet along South Lake Tahoe's near shore zone, the latter radiocarbon dating between 4800 and 6300 years ago. Other stumps, submerged up to 90 feet in lakes tributary to Lake Tahoe, document medieval period droughts dating from about 500 and 1000 years ago. The presence of submerged ancient forests and archaeological features suggests a link to large-scale climatic trends and raises issues regarding our current perceptions and expectations for human land use in the Tahoe Sierra. A consideration of climatic variability is important to an understanding of human land use practices and settlement habits. Our contemporary dry summer/wet winter precipitation pattern did not prevail continuously in the past, and variable climatic regimes may have allowed for year-round residence in the Upper Truckee River sub-basin at some times and prohibited even seasonal occupation at other times. Rises and drops in Tahoe's lake level would have closed and opened up acres of near shore zone for colonization by plants, animals and humans, altering the hydrologic regime of the Upper

Truckee River.

III.J.3.2.2 Cultural Setting

Prehistory

The archaeology of the north-central Sierra region was first outlined by Heizer and Elsasser (l953) in their study of sites located in Martis Valley in the Truckee-Tahoe Basin. Subsequent research within the Tahoe Sierra has produced a more detailed picture and revision of the region's culture history. A broad view divides the prehistory of the Sierra Nevada and adjoining regions into intervals marked by changes in adaptive strategies that represent major stages of cultural evolution (Elston, 1982 and 1986). At the regional level, in the Tahoe Sierra for example, finer grained archaeological phases divide local prehistoric sequences (Elston et al., 1977; Elston et al., 1994).

The oldest finds reported for this region suggest occupation at 8000 to 9000 years ago, the `Tahoe Reach Phase'. Climates warmed and dried rapidly, although conditions remained relatively cool and moist. Sparse prehistoric populations have been equated with a Pre-Archaic foraging economy based on high residential mobility, large game hunting and non-intensive plant food processing and storage. Pre-Archaic sites are nearly absent in the Tahoe highlands and reflect the incipient influx of people entering the area soon after the retreat of Sierra glaciers.

The succeeding Early Archaic period, the `Spooner Phase', is correlated with a marked warming and drying climatic trend. It dates from 8000-5000 years ago, with the onset of more mesic conditions around Lake Tahoe beginning about 6000 years ago. The prehistoric economy was focused on hunting, but seed processing tools made their first appearance in large numbers. Early Archaic sites are sparsely represented in the Tahoe Sierra. Fishing in highland lakes and streams was a likely subsistence pursuit, but little trace is left of this perishable technology (Lindström, 1992 and 1996). The prospects for longer-term encampments and year-round use of the high country during this dry time have been proposed (Lindström, 1978; 1992; 1996).

During the Middle Archaic, dating from about 5000-1300 years ago, climates became more mesic. This period is regionally represented by the `Martis Phase.' Population densities were on the rise, with a return to more optimal conditions in the lowlands. Here, the Middle Archaic strategy entailed a decrease in overall mobility, increased land-use diversity, and a broadened diet. More intensive prehistoric use of the Tahoe Sierra began during this period, as mixed-mode foragers-collectors ventured into the highlands on seasonal gathering, fishing, and hunting forays. Middle Archaic occupations are well represented in the archaeological record of the Tahoe Sierra. It is likely that this greater archaeological visibility reflects increasing seasonal use of highland environments by larger populations staging from more permanent base camps at lower elevations.

The Late Archaic period, about 1300 years ago to historic contact, is characterized archaeologically by the `Kings Beach Phase.' Changes in prehistoric technology are profound and are understood to reflect more intensive use of all parts of the environment, with a corresponding increase in dietary variety during this time. This period is marked by an overall xeric trend, punctuated by cool/moist periods versus periods of severe drought. Such extreme climatic fluctuations allowed for year-round residence in the Tahoe highlands at some times and prohibited even seasonal occupation at other times. Two severe droughts occurred, one around 1000-900 years ago, and another around 600-500 years ago. Throughout the Late Archaic, prehistoric populations continued to increase, with dramatic rises occurring along the lower eastern and western foothills during the early, more mesic, part of this period, `Early Kings Beach Phase' (Elston et al., 1994; Moore and Burke, 1992). More intensive and long-term use of the Tahoe highlands during xeric intervals within the last 1000 years is documented (Lindström, 1982; Lindström and Bloomer, 1994). In the crest zone (between 8000 and 9000 feet elevation), house rings and storage facilities are reported and bedrock mortars and slab milling features are inventoried well above the contemporary range of oak and grass resources (Lindström, 1978). This later period is correlated with the ethnographic Washoe.

Changes in adaptive strategies and population size reflects native peoples' growing understanding of their environment and may be attributed partially to changes in the paleoclimate and subsistence base, and to prehistoric demographic change. Disruptions imposed by incoming Euroamerican groups caused declines in Washoe population numbers and traditional resource use.

Washoe History

Lindström et al. (2000) provide the most recent summary of Washoe Indian history, fishing, and land use at Lake Tahoe. They focus on how Washoe horticultural practices, fishing, hunting, micro-burning, and resource conservation influenced the structure and composition of Tahoe landscapes and biotic habitats. Information is drawn from the core Washoe ethnographic literature (e.g., Barrett, 1916; Lowie, 1939; d'Azevedo, 1986; Downs, 1966; Nevers, 1976; Price, 1980). Most pertinent to the study area and aboriginal fishing are Freed (1966) and the unpublished field notes Edward Siskin (90-03). Lindström (1992, 1996) provides a comprehensive discussion of aboriginal fishing patterns along the Truckee River, a central theme in the history of the project area.

Washoe Place Names

Named places are listed below in Table III.J.1, part of the cultural landscape of the Upper Truckee that encompassed camps and fishing spots important to the Washoe. These are only some of the names given to individual campsites and landmarks; camps, for instance, were frequently identified with the name of the leader (d'Azevedo, 1986). Most of these names are included with varying orthography in Lindström et al. (2000), based on d'Azevedo (1956), Freed (1966) and Nevers (1976). With the exception of those marked with (*), these terms have not been corrected for consistency with William H. Jacobsen, Jr.'s, orthography (1996:1-6) and appear as provided in the sources cited.

Table III.J-1 Washoe Place Names

English	Washoe	Translation	Source
Lake Valley, including the delta of the Upper Truckee-Trout Creek watersheds; includes the area around Meyers	*Méšga*		orthography: d'Azevedo (1956); additional reference: Freed (1966)
The delta formed by the Upper Truckee and Trout Creek drainages	*Mešuk málam*		d'Azevedo (1956)
Upper Truckee River	*Imigi Watah [Wá_a*]*	"[cutthroat] Trout Creek"	orthography: Nevers (1976); additioanl references: d'Azevedo (1956); Freed (1966)
Trout Creek camp and milling station	*Ma tush ha who watah [wá_a*]* *_sigóhu [wá_a*]* *dewgélki_*	"White fish Creek" "Kidney [shaped] creek" "Shaking or vibrating rock"; name for milling station and camp	orthography: Nevers (1976); additional references: d'Azevedo (1956); Freed (1966); d'Azevedo is source for second term, considered to be older name for the creek and for camp name
Camping spot supporting many fishing houses	*Dabayó:duwez**	"flowing away over the edge"; described as a waterfall and same name given to outlet of Lake Tahoe	orthography: Jacobsen; additional references: d'Azevedo (1956); Freed (1966); Siskin (90-03)

English	Washoe	Translation	Source
On side drainage (west) of Upper Truckee, a place where "sucker" fish" taken	***Ázawakhu ityútcim***	**"Sucker fish" + method of fishing employed**	**Siskin (90-03): This term was applied to a specific location where "enormous" numbers of suckers ran early in the spring (April) "in this one spot"**
Section of Upper Truckee where fishing camp associated with Mike Holbrook is located; may be older term for Upper Truckee; may be drainage from Echo Lake into Upper Truckee;	***Méšuk Wá_a****	**[fish spear?] creek**	**d'Azevedo 1956; Siskin (90-03)**

Washoe Traditional Territory and Resource Allocation.
Before disruption of the aboriginal life way by Euroamerican incursions, appropriation, and encroachment (ca. 1850), Washoe aboriginal territory covered a lozenge shaped area straddling the Sierra north and south of Lake Tahoe, from the southern shore of Honey Lake, south through Antelope Valley and the West Fork of the Walker River (d'Azevedo, 1986). The traditional economy was based on seasonally available resources from catchments tethered to camps where "first use" rights and accessibility were maintained by priority of use. Key among these resources was fish and pinyon pine.

Access to these key resources and exotic goods was maintained through complex and multi-layered social networks that exceeded linguistically defined "territories." "Sharing" rather than "trade" best describes the exchange that facilitated resource allocation and exchange. Some commodities were indeed traded; at the end of the 1800s, Susie Dick reported that one deer hide could bring enough pine nuts for the winter, for instance (Dangberg, 1920s in Price, 1980). But access to specific resource areas is described in terms of visiting relations and bringing gifts. Roasted pinyon nuts or salt from Topaz Lake were often taken to Miwok relations and hosts in acorn country.

The homeland is subdivided into three regions defined as areas of "most frequent" interaction and cooperation among neighboring communities (d'Azevedo, 1986:469). Overlapping resource areas, cooperation in defense, and collaborative harvests and festivals occurred most consistently among neighbors within one of three regions: the *wélmeltiz* ("northerners"), the *ṕá:wazluz (*"valley dwellers"), and the *há_aleltiz* ("southerners"). However, affiliation with any one of these areas was (and continues to be) transcended by identity with and access to the entirety of the "Washoe world," "within which one could move freely by exploiting a lore of common origin and hospitality accorded distant or putative kin"(d'Azevedo, 1986:485).

The *ṕá:wazluz* occupied Carson Valley, often wintering in the Pine Nut Hills; the *wélmeltiz* were north, from Eagle Valley to Truckee Meadows and Honey Lake; and the *há_aleltiz* lived south, including the Markleeville-Woodfords areas, to Topaz Lake and Antelope Valley. Allocation of camping areas, fishing streams, and other resources at Lake Tahoe was based on affiliation to one of these three subdivisions and on relationships to specific families. The Upper Truckee with the Trout Creek drainage, formed the premier summer destination for two groups: *há_aleltiz* ("southerner") families of the Woodfords-Markleeville areas and for many *ṕá:wazluz (*"valley dwellers") from the Carson Valley.

Washoe Fishing

As emphasized by Lindström (1992; 1996), a variety of fish with staggered spawning runs provided the most predictable and reliable food source in the Washoe diet, available abundantly throughout most of the year either from highland fisheries such as Tahoe or lower altitude rivers such the Carson River. Fish were sought even in deep winter by snowshoe-clad fishermen engaging in ice fishing. As well as a source of fresh protein for most of the year, dried smaller fish and fish eggs formed a significant part of winter stores. The complexity, variety, and elaboration of the fishing complex: methodology, technology, and settlement, also supports the primacy of fishing in the traditional economy, which in turn heavily influenced population and the timing and duration of movement through-out the territory.

Although Lake Tahoe is often characterized as the premier fishery and summer residential base in Washoe territory in published sources (e.g., Downs, 1966) and contemporary lore, many Washoe had different summer destinations. *Há_aleltiz* ("southerner") families from Antetlope Valley, for instance were known to summer in Bagley Valley, fishing the upper reaches of the West Fork of the Carson River, while Markleeville residents moved into Pleasant Valley and joined several Woodfords families at Silver and Twin Lakes (Siskin, 90-03). The Washoe did not converge on Lake Tahoe en masse from throughout their extensive aboriginal territory, but it is clear that those making the trip were returning to home bases, to fisheries and resource catchments claimed and maintained along each drainage entering Lake Tahoe (e.g., Freed, 1966; Lindström et al., 2000; Nevers, 1976). As Lawrence Astor stated: "Always, we had areas where families stayed, areas they owned because they always used them; this applies to spawning areas and pine nut areas. Each family had a creek and a picking area before land purchases by whites forced them out" (Rucks, 1995:146).

No less nutritionally significant or entrenched in tradition, is the pine nut complex. But paleoecologists (e.g., Wigand and Rhode, 2000) indicate pinyon is a more recent arrival in Washoe traditional territory (500-1200 BP), and is less predictable with variable yields susceptible to a variety of climatological fluctuations (Lanner, 1981). Year-round residence at Lake Tahoe and treks to acorn country are documented strategies for dealing with poor pinyon yields; while no such equivalent contingencies are documented for failed fish runs. The only "failure" of the Tahoe fishery ever documented in the literature or recounted in tradition was a consequence of Euroamerican encroachment beginning with appropriation of Washoe fishing grounds and ending with the extinction of Lahontan cutthroat trout by 1938. (Although whitefish runs up Trout Creek persisted longer and attracted communal drives observed in the early 1900s (e.g., Vernon, 1980)

As throughout the Great Basin, fishing was among the first and arguably most important aboriginal subsistence industry affected and eventually eradicated by Euroamerican encroachment. Washoe, defending their fishing rights, provoked the few acts of aggression documented during the early days at Tahoe: Asa Hawley, writing about his experiences in Lake Valley in 1854, wrote: "The Indians would not allow white men to fish in the lake. They tried to drive me off..." (Scott, 1957:180). The fisheries and meadowlands attracted settlers first and the preemption of these areas and subsequent destruction of other traditional resources in surrounding areas from logging and grazing, contributed significantly to the focus of Washoe leaders in the late 1800s and early1900s on maintaining viable pinyon and access to traditional gathering areas in the Pine Nut Hills. Pinyon and the cultural complex surrounding the harvest proved more resilient and adaptable to the environmental and social consequences of contact.

In terms of numbers of people supported, the Upper Truckee delta may have been the single richest fishery and premier destination for the Washoe at Lake Tahoe, with abundant plant and animal resources to support large gatherings and communal events.

Other resources of interest included "oysters" collected and steamed in the sand, and "sunflowers" (most likely *Wyethia mollis*) and strawberries, also noted by Euroamerican observers (Scott, 1957:179). One former resident of Lake Valley recalled that "the Washoes... continued their age-old practice of whisking the tops off sunflowers in the valley, gathering seeds and grinding them into flour" (Scott 1957:186). Although many staples of the traditional diet were devastated by historic logging and grazing, Washoe people continued to collect an array of resources through-out the post-contact period until post WWII development. This pattern of attenuated but persistent access to landscapes and traditional resources at Lake Tahoe came "to a screeching halt" (Stephan James interview) just after the war and accelerated privatization locked up land where many Washoe families had been tolerated and encouraged to live, furnishing labor to pre-WWII residents and establishments.

Imigi Watah: The Upper Truckee Fishery. As stated above, the delta was a primary summer destination for *há_aleltiz* families of the Diamond Valley-Woodfords areas and for many *pá:wazluz* from the Carson Valley. The Upper Truckee River itself accommodated numerous established fishing areas (Figure III.J-1) and a variety of harvesting methods (see below), sustaining multiple family groups converging to harvest Lahanton cutthroat during spring runs and early summer spawning beds. In addition, the river corridor was one of the primary trek routes to the western Sierra for parties moving to acorn gathering grounds in Miwok country. One of only three named "stopping places" in the Tahoe basin occurs along its course. (The other named stops include another camp in the delta, Trout Creek, and a camp at Blackwood Creek for parties taking the Georgetown route). The camp at Trout Creek was an important stop in the fall for harvesting and drying whitefish as trekking provisions and host gifts, or as winter stores for parties leaving the Tahoe basin for the Pine Nut Hills. In addition, the delta camps would have provided year-round residence during drier climatological periods.

Domestic camps, complete with permanent bedrock kitchen facilities such as milling stations, were located in the vicinity of streams, "near but not at the water" (Nevers, 1976:9) where families maintained the prerogatives of first rights to fish and to harvest nearby resources. Communal fishing and processing areas and individually owned locations where men constructed their "fishing houses" were adjacent to the river.

The next section presents information on the stratification of fishing areas and degrees of ownership, fishing methods, and technology, summarized primarily from Siskin (90-03) from interviews he conducted in 1937 with Mike Holbrook, George Snooks, and Charlie Rube about fishing focused on the Upper Truckee. Lindström (1992, 1996) should be consulted for in depth descriptions of this technology, fish biology and ecology, the antiquity and richness of the Truckee River fishery, and archaeological and ethnographic evidence for the pivotal role fishing played in the aboriginal economy.

Méšuk wa't'a: According to Siskin's consultants, and verified recently by Stephan James, locations on the river for catching the biggest fish: for constructing fishing houses ideally situated for spearing the biggest trout, or where larger fish could be trapped, were choice spots, owned by individual men and handed down from father to son, or to brother, or closest male relative. An example of such an exclusive site, according to both George Snooks and Charlie Rube, is located south of the project area along the upper portions of the fishery. This site belonged to Mike Holbrook, through his uncle (his mother's brother). Both men identified this as the "best site" on the river. They identified this location as on *Méšuk wa't'a*, described as part of the Upper Truckee drainage.

Dabayó:duwez: Méšuk wa't'a may relate to this section of the river, or may designate the drainage that used to flow from Echo Lake into the Upper Truckee, forming a water fall; a waterfall, identified as *Dabayó:duwez* to d'Azevedo in 1955, was described as an important fishing spot with "many fishing houses." Siskin's description of Mike Holbrook's family spot (Plate J-1) places it near the waterfall noted on George Snook's map as the "place for net." (Panel 1; Figure J-1); and George Snooks located the waterfall "across from Mike Holbrook's Uncle's claim." This was the only location on the river known to George Snooks where big fish were caught by setting a net overnight where large fish attempting to hurdle the falls, could be trapped as they fell back into the net.

Stephan James recently related that this same location was also known to his generation as an ideal spot because fish pooled here unable to go further upstream (Stephan James, interview). (Mr. James also related that he and his cousins used to catch fish with gaffe hooks until post-WWII development and privatization made such illegal forays increasingly difficult.)

In any case, the most favored locations seemed to have been up stream (south of the project area), where men maintained exclusive rights to specific areas where personal nets could be set in prime locations, such as *Dabayó:duwez,* or where fishing houses were constructed over prime courses where the biggest fish were known to congregate. The fishing house technique was described as *maza_az* and Siskin recorded details of construction, placement, and technique.

Bagocaz: The fishing technique most frequently employed in the "middle-lower" section of the Upper Truckee drainage, and most likely adjacent to the project area, involved construction of elaborate compartment traps for capturing large numbers of fish during the initial runs early in the spring when the water was low. (Later in the season, when the water was higher, these traps could not be constructed.) The trap involved two barriers and a series of compartments that held fish jumping the first barrier (figures J-2a and J-2b). These facilities were constructed, operated, and owned by several families. They took 3-4 days to build and new ones were constructed each spring. According to George Snooks, only the *ṕá:wazluz (*"valley dwellers") from the Carson Valley engaged in this industry. (Although both *ṕá:wazluz* and *há_aleltiz* owned individual fishing houses up stream.) And Mike Holbrook stated the *ṕá:wazluz* employed this technology on the Carson River; one was located near Dresslerville and another about 15 miles "further along." Charlie Rube stated there were three locations in the Upper Truckee where these traps were constructed, which required shallow water and a hard bed (so the bottom did not wash out).

Each site was owned by "3,4, or 5" families who were related, each with rights to fish caught in one of the compartments that constituted each trap. Described as located in less choice locations; less desirable than individual fishing house locations upstream, one advantage was that several relatives could fish at once. These compartment traps spanned the entire river, blocking most of the fish to upstream fishermen. Those with spots upstream would complain if the river was dammed too long and the compartments could be opened periodically to let fish through. Although each participant "owned" one of the compartments and the fish it contained, those with few fish were provisioned by those with more fish. Fish were tossed onto the bank and clubbed.

Belézšiyi: was a herd and trap method whereby fish were pushed toward a constructed weir for scooping by nets or baskets. A large willow mat that could weigh over 500 pounds when wet was pushed along the stream course "herding" fish towards the weir. The mats were constructed and operated by a group of six men. Three to a side operated the mats and women assisted in scooping out fish and everybody clubbed the fish thrown onto the banks. These drives were effective for smaller fish and are reported to not have been used at Tahoe although this method could have been used in the fall for whitefish runs in Trout Creek. The wall took about 30 minutes to construct, and the willow mat, a couple of hours.

Dáya' lépeš: "caching fish with a net" involves the use of nets constructed on a circular willow frame with different sized mesh (for different fish) for scooping quantities of smaller fish in shallow water. This method was popular in the fall and would have been employed for whitefish in the fall at Trout Creek. Partners would work holes together. One would place the net downstream while a partner worked a white (peeled) willow pole to scare the fish towards the net. This could be done repeatedly at the same location. The fish were scooped and dumped out onto the bank and transferred to burden baskets.

Ityútcim: Another technique described to Siskin was employed in the divided section of a small stream (*Ázawakhu*) that fed into the west side of the Upper Truckee. In the early spring, in April (again, when the water is relatively shallow), one side at time was dammed off and the stranded fish collected. This was done to catch suckers.

This complex and multi-layered industry was tuned to the timing of fish runs up streams and their return to the lake. Cooperation was required for construction and operation of facilities, and coordination with upstream users in the timing and duration of the operation of the large, complex compartment traps (the Bagocaz method). Harvesting and processing, some fish for immediate consumption and some fish for storage, would have occurred close to these facilities. Main habitation sites were located at a convenient location but not adjacent to the stream itself.

Washoe Horticulture and Biotic Change

It is not known how Washoe horticultural practices at Lake Tahoe influenced the structure and composition of various habitats. Studies to measure the effects of aboriginal environmental manipulation -- planting and reseeding, pruning, culling, weeding, and cleaning, and fire and conservation practices -- on both plant and animal populations, have not been conducted. Since Euroamerican settlement, the Washoe have felt restricted from harvesting plants on any but sporadic and opportunistic bases (Lindström et al., 2000; Rucks, 1996). Evolution of the "natural" biota of the Lake Tahoe Basin may have been influenced by millennia of Native American horticultural practices, including micro-burning. Intentionally set fires were strategically timed and placed, such that native burning extended the range, increased the frequency, and altered the timing of natural fires. Fire setting practices concentrated around lakeshore and riverine camps and inside prime meadow resource catchments. Systematic and localized micro-burning by Native Americans may have kept down fuel loads and maintained an open grassland environment surrounding the Upper Truckee River.

Post Euroamerican-Washoe Contact

Contact between the Washoe who habitually camped in Lake Valley and Euroamerican explorers had no doubt occurred many years before, but John Calhoun "Cock-Eye" Johnson is the first to encroach in Lake Valley, when he opened the route over Echo

Summit in 1848. The lifeway and frontier worldview of Euroamericans began to substantially impact Washoe lifeways and ecology in the 1850s, following westward expansion and emigration, particularly during the California gold rush ca. 1849. Thousands of emigrants poured through Washoe country heading west. After gold was discovered in Virginia City in 1859, the area became a major corridor for two-way traffic between California and the Comstock that brought the familiar cycle of mining related effects into Lake Valley, including road building and establishment of way stations, logging, haying, ranching, settlement, and competition for water and other resources. In 1852, emigrants camped in Lake Valley, followed by the first homestead in 1854, the establishment of Yank's Station in 1859, and of the Pony Express route, heavily used by Comstock traffic in the 1860s. Small-scale logging started in 1859, with large-scale industrial logging beginning in 1874. Haying and ranching become established, preempting meadows and appropriating water. It is during this period of initial encroachment and adjustment in Lake Valley, in 1854, that Washoe individuals are reported to have speared hundreds of trout and tried to prevent Euroamericans from fishing; a battle they were to lose with the establishment of a commercial fishery near the mouth of the Upper Truckee in 1859.

The scale and magnitude of these changes over little more than a decade is hard to comprehend. But the Washoe persisted, intent on maintaining ties to their traditional lands and sustaining and adapting traditional subsistence regimes, cultural practices, and belief systems. The Washoe retained links to their ancestral lands around Lake Tahoe by working for and camping near lands accessible to loggers, dairymen, fishermen, ranchers, and resort owners; women performed domestic labor and made baskets to sell to tourists. Children were cared for by elders and relatives of their grandparent's generation or older siblings. Childhood at the Lake is characterized as carefree and fun, and it was during these summers, spent with elders who continued to collect medicines and some foods, process and prepare pine nut soup and acorn biscuits, and make baskets, that history, cultural knowledge, and traditions were handed down. Ties established between individuals and the new landowners that enabled these patterns were severely impacted by the scale and magnitude of development after WWII. Today the tribe, as a political entity, and individual members, are reclaiming access to resources and use of public lands.

Euroamerican History

The philosophy and outcome of generations of indigenous land management went unnoticed by Euroamerican newcomers, who viewed Tahoe's landscape as "natural" and "unowned." Such misconceptions supported, in part, their justifications for taking Tahoe land and resources from a people who seemingly never owned or managed them in the first place. Although the Washoe were largely excluded from Lake Tahoe, one element of Washoe culture that permanently remained is its name. Variously known as "Mountain Lake", "Lake Bonpland", and "Lake Bigler", the name "Tahoe", adopted early popular jargon, is derived from the Washoe word *da'ow*, signifying "lake." Lake Tahoe was not officially named by the California legislature until 1945.

Transportation and Early Settlement

The movement of people, goods, and services through the area chronicles the pathway of human disturbance in the Tahoe Basin. The evolution of road systems mirrors the development of Tahoe's forest and meadowlands and adjacent communities. This history can be traced on historic maps depicting the routes of transport (figures III.J.3 through III.J.14). Accompanying human impacts corresponded to the growing number of travel corridors and associated communities.

Tahoe's proximity to wood, water, mineral, rangeland, and recreational resources justified the investment of a significant amount of capital and energy into transportation to and within the basin. The opening of the Comstock mining boom in Nevada, beginning in mid-1859, and the need to transport people and supplies to the mines of both the Comstock Lode and the Mother Lode, prompted a sudden surge of heavy wagon and freight traffic through the Tahoe Basin; quicker routes were sought across the Tahoe Sierra. Scott (1957; 1973) has described these various routes in detail.

The "Placerville Road" was one of the earliest road components that comprised the Bonanza Road System between Placerville and the mines of the Comstock. The road followed earlier emigrant and wagon routes over Echo Summit and through Lake Valley along Tahoe's south shore, eastward to Mormon Station (Genoa) and finally to Virginia City (figures III.J.3 and III.J-4). The Placerville Road assumes much of the alignment of modern Highway 50. Laid out in l852, it was passable for wagons before 1854 (Hoover, Rensch and Rensch, 1966:76). Passage of the California Wagon Road Act of 1855 provided for the Marlette-Day central Sierra transportation survey. This act prompted the opening of additional routes and drew masses through the Tahoe Basin. In 1860, the Pony Express went from Genoa, over Daggett Pass on Kingsbury Grade, around the southeast end of Lake Tahoe, and over the Sierra Nevada into Placerville. With the completion of the transcontinental railroad in 1869, regional travel was gradually shifted to Donner Pass. Lake Tahoe destinations centered on the railroad between Truckee and Tahoe City, with connections by steamer travel around the lake, and coach and horse access to the final destination.

In the project vicinity, the Placerville Road passed along present-day Pioneer Trail. A lakeshore leg of the Placerville Road branched northward and passed along the Upper Truckee River due east of the project area. An early destination of this "dog leg" in the main road was the Lake House, erected in 1859 at the east edge of the upper Truckee/Trout Creek marsh. The Lake House was Tahoe's earliest lakeshore hotel (Figure III.J.4), and later known as Rowlands (Figure III.J.6) and Al Tahoe. The Lake House Road is labeled on Figure III.J.3. Several other secondary roads cross the Upper Truckee and traverse through the project area; all may have ultimately tied into the Lake House Road.

Martin Smith was Lake Valley's first settler, establishing a trading post in 1851 to serve emigrants and other wayfarers. "Lake Valley" was an established locale at least by 1853, when the Placerville Herald (1853) asserted that there was a "discovery of gold, of great purity, in Lake Valley, upon Johnson's route to Carson Valley." The reporting was bogus and the "Lake Valley Diggings" never amounted to anything. The first official post office did not open in Lake Valley until 1861 (Salley, 1977:116).

Logging

Historical records and photographs (Scott, 1957, 1973) indicate that many timber stands of the Lake Tahoe basin were clear-cut (or nearly so), with little regard for streamside areas. Logging techniques of the day relied heavily on cross-country skidding, which damaged existing young growth and thus future stand regeneration. Environmental degradation was compounded by coincident erosion of decomposed granite soils. Clear-cutting on hillsides accelerated erosion, releasing sediment loads into the lakes and streams of the basin (Lindström, et al. 2000). Intensive logging left forests fragmented and contributed to the decline or extinction of birds and mammals that required structurally complex forest habitat (Elliott-Fisk et al., 1996).

Scientific studies indicate that the structure and composition of modern forests in the Lake Tahoe Basin are very different from the pre-Euroamerican forests (Lieberg, 1902; McKelvey and Johnston, 1992; Sudworth, 1900; Taylor, 1997). Comstock-era harvesting targeted vigorous stands that had matured during the mid-1600s to mid-1800s, a period of generally cooler and wetter conditions (Lindström et al., 2000). Overall, virgin stands were more open and composed of trees that varied greatly in diameter. Early explorers described the forests of the Tahoe Basin as "dominated by giant pine trees with so much room on the forest floor that riders could travel at full gallop without losing their hats" (San Francisco Chronicle 1995).

The first lumber mill in Lake Valley, Woodburn's water-powered sawmill, was constructed in 1860, being located east of the project area some two miles northeast of Meyers on the Old Placerville Road (Pioneer Trail). Woodburn's supplied lumber for many of the hostelries, barns and stables that were mushrooming on the old Placerville Road (Scott, 1957:185). The urgent demand for fuel wood and the more pressing needs of the mines (with their square-set timbering system) and those of the growing settlements created an insatiable demand for lumber. As areas in the Carson Range were depleted of their timber, harvesting was directed to the Lake Tahoe Basin. A general history of Comstock lumbering is given by Galloway (l947), Lord (l883), and Shamberger (l969), with some additional information offered by Knowles (l942), Myrick (l962:424-425), and Scott (1957:203-220, 1973:15-33). A detailed discussion on logging in Lake Valley is provided by Lindström and Hall (1998).

Four major lumber companies operated within the Tahoe Basin (Figure III.J.4). Each developed an impressive network of sawmills, railroads, tramways, flumes, and rafting operations, which were designed to cut and move the lumber over the crest of the Carson Range and down to the mines of Washoe. The Carson & Tahoe Lumber & Fluming Company (CTLFC) emerged as the chief operator, with holdings throughout the Tahoe Basin. Bliss and Yerington formed the company in l873, with headquarters at Glenbrook.

The CTLFC's Lake Valley lumbering operations were centered near present-day Bijou, with cutting targeting uplands from Luther to Daggett passes. Much of this logging was done on a contract basis with local loggers who supplied stipulated amounts of timber for large firms. French-Canadian lumberjacks were hired to fell the timber and Chinese and Portuguese laborers cut cordwood (Lindström and Hall, 1998; Scott, 1957:213).

During the late 1880s, the CTLFC expanded their operations in Lake Valley to include a railway (incorporated by allied interests as the Lake Valley Railroad) and constructed an 1800-foot railroad pier at Bijou. The pier served as a landing for steamers and barges and a point where logs were discharged directly into the water to be V-boomed and towed to the Glenbrook mills. Saw logs were also floated down the Upper Truckee River at high water and the timber was banked at the outlet before rafting to Glenbrook. Hence the river mouth was named "Bank Land." In 1889, two years after the CTLFC had installed their Lake Valley railroad; they drove double rows of pilings to hold back the sand at the influx of the Upper Truckee River. Pilings were also driven at strategic points along the river, serving as 'bumpers' to ease the passage of logs (Lindström, 1994). A `go-devil' barge retrieved sunken logs from the shallow water at the Upper Truckee's outlet by winching them to the surface (Scott, 1957:209).

During the 1890s the CTLFC obtained timber rights totaling over 6,000 acres throughout the south shore of the lake, acquiring rights on Barton family holdings, among others. The timber business prospered, not only for lumberjacks, log rollers and cordwood splitters, but for those ranchers who provisioned the lumber operations. While the larger suppliers of hay and grain were Carson Valley ranchers, Lake Valley locals provided supplementary amounts of feed. Among the consistent suppliers of dairy products were the Bartons, Celios and Fitch & Kyburz.

Following the pattern of early logging procedures, the timberland ultimately became cut over and operations ceased. The mid-1890s found lower Lake Valley stripped of its marketable timber and large scale logging in this region was over. The Lake Valley Railroad was torn up during the summer of 1898, and all salvageable materials and equipment were pooled with those from the Glenbrook operation and taken by barge to Tahoe City for incorporation in the Lake Tahoe Railway and Transportation Company's line to Truckee.

Ranching.
Increasing human populations in the Tahoe Basin and surrounding region were supplied with meat, milk, butter, and cheese from sheep and cattle that grazed high elevation alpine areas and lower elevation wetlands, meadows, and forest floors. Agriculture and seasonal stock grazing largely centered on lakeshore meadows in proximity to settlement. Lake-level lands generally supported cattle, and high meadows were used for sheep grazing after 1900.

Ranching Impacts: The Washoe were especially affected by the impacts of livestock grazing in the basin, which caused declines in many plants important to their people (Elliott-Fisk et al., 1990; Lindström et al., 2000). Early season entry into rangelands and excessive overgrazing exterminated native browse species in many areas, increased erosion, slowed forest regeneration, and altered forest stand structure (Leiberg, 1902; Sudworth, 1900).

Not all meadows were subject to over-grazing. Photographs taken in 1930 of "Rowland's Marsh" (now the site of Tahoe Keys at the mouth of the Upper Truckee River) show an extensive and virtually unfragmented meadow/wetland system. Many bird species associated with wetlands and meadows were recorded in Orr and Moffitt (1971) during this period, suggesting that these surviving and intact systems provided valuable habitat in the basin (Lindström et al., 2000).

Although overgrazing, which occurred primarily during the first half of the 20th century, produced lasting changes in communities of grasses, forbs, and shrubs (McKelvey and Johnston, 1992), erosion caused by grazing in the 20th century was not nearly as great as that caused by logging, which occurred during the later19th century. The Lake Tahoe sediment record does not reflect a significant rate of increase in lakebed deposition between 1900 and 1950, as was the case between the 1870s and 1890s (Heyvaert, 1998).

Ranching Production: Along the Placerville Road, hostelries, way stations and inns such as the Lake House at the foot of the Upper Truckee marsh, sprang up in order to provide the services required by travelers. Markets created by teamsters traveling through Lake Valley prompted the development of farming and ranching. At first, small meadowlands and family vegetable gardens supplied the needs of the individual toll stations and inns along the Placerville Road. As demands escalated, meadowlands were quickly preempted (usually in units of 160 to 320 acres), wherever wild hay could be harvested and beef and diary cattle could be grazed. With hay selling by the pound and fresh food at a premium, land changed hands rapidly, and speculation prevailed. Some ranchers neglected even to acquire legal title (Strong, 1985:20).

Apart from local consumption, the market for mountain range cattle was usually in Reno or Minden, although San Francisco meat packing companies occasionally bought it. Ranchers also made their own butter, selling the surplus in Carson City, Sacramento, Placerville and San Francisco (*Tahoe Daily Tribune,* 1981:15J). The *Sacramento Daily Union* (1857) reported in 1857: "Messrs. Gilbert & Garrish, who recently arrived from Salt Lake, with some 600 head of cattle, have driven them to Lake Valley to summer there." In the summer and fall of 1862, 400 tons of hay were cut in the valley's meadowland (Scott, 1957:185). Scott (1957:186) reported on grazing activities during the 1870s as follows. In 1870 the "California Products of Agriculture" census showed that 228 tons of hay had been baled in the Lake Valley Township and listed 100,600 pounds of butter as produced. In 1875, C.F. McGlashan noted in his "Resources and Wonders of Tahoe" that Lake Valley annually turned out 14 tons of butter and cheese with two cooper shops doing a capacity business in manufacturing butter firkins from the local white fir. Butter sold at the high price of 42 cents a pound and according to McGlashan was "in great demand for epicures." The productive season was June to November, during which time butter was kegged, eggs crocked, beef cattle fattened, and hay baled. In 1875, Lake Valley was still mainly a "hay and dairy producing center, dotted with fertile ranches" and local ranchers contributed most of the 800 tons of hay cut along Tahoe's shoreline. That year hay brought the deflated price of $30 a ton in Carson. In 1880 a period correspondent reported that: "The valley affords pasturage for 1800 cows" (Scott, 1957:186). By 1915, 13 dairies were still thriving around the lake (*Tahoe Daily Tribune,* 1994:70)

Ranching Seasonal Transhumance: Transhumance refers to the seasonal migration of livestock, and the people who tend them, between lowlands and adjacent mountains. The ranching industry was seasonal and Lake Valley was typically used as summer range for livestock. Horace Greeley described this seasonal transhumance pattern in an article published in the *New York Tribune* recounting his trip through Lake Valley during this early period (*Tahoe Tattler,* V.4, No. 2 7/8/1938 "Meadow to Marsh: Tahoe '38").

> "There is fine grass on Lake Bigler and several hundred cows are kept there in summer, making butter for the California market; when snow falls, these cattle are driven down to the valley of the Sacramento, where the rains are now commencing, and there they live without hay until June. Business is very lucrative, land costing nothing and being unfenced. Taking into account gold, timber, and grass, the Sierra Nevada is probably the richest and most productive mountain chain on earth."

The harsh winters of the Sierra Nevada highlands made year round stock-raising impossible. Similar constraints were posed by the dry summers in the lowlands (Sioli, 1883:112). Accordingly, patterns of land use in the Tahoe Basin correspond to patterns in the adjoining valleys and foothills. Between the 1850s and 1870s, ranching was a small-scale, precarious enterprise based on multiple economic strategies. Early mining was not the get rich adventure many had anticipated and landowners had to turn to other livelihoods, surviving by mining in the rainy winter and spring and undertaking one or more other enterprises in the summer and fall (merchandising, logging, saw milling, farming and ranching, maintaining toll roads, construction/carpentry, etc.). During the 1870s, such multiple economic strategies were largely replaced by a single economic strategy and for ranchers, for example, the seasonal resource base necessitated that they acquire large acreages with summer pastures in the higher elevations in order to sustain livestock. Prominent families bought out small-parcel landowners and consolidated their ranching empires primarily on the beef and dairy business. With the help of outside labor, stock was grazed on winter holdings in the valley and foothills on either side of the range and on summer holdings in the mountains (Lindström, 1995:27-28).

Weeks (1934:45-48) in his 1934 report on the status of agriculture in western El Dorado County correlates various ranching systems and their environments, particularly the availability, amount, kind, and source of summer feed. He describes three types of ranching systems that directly tie into this mix of multiple and single economic strategies. One of these types, the “migratory dairy and beef enterprise” corresponds with the grazing pattern observed throughout much of the Tahoe Basin.

> "The Migratory Dairy and Beef Enterprise. Situated in southwestern El Dorado County is a ranch of nearly 1800 acres, supplemented by a slightly smaller grazing acreage in the high Sierras, also owned by the operator. The income is derived from the sale of beef, cream, whole milk, a few hogs, and a little wood. Production is entirely on the basis of pasture, with the exception of a small amount of hay and barley purchased and a small amount of hay cut from the wild grass. The entire dairy is moved to the mountains about June 1. The return is made between October 15 and November 1. The general plan of production is to sell cream to a Sacramento creamery. The cream is shipped daily from the station ½ mile from the farm headquarters. The skimmed milk is fed to hogs purchased for fattening and is their only feed. Calves are kept until they are about eight months old and sold in the fall soon after the return from the mountains. The calves and cows that have been culled from the dairy herd, together with a certain number of stock cows kept primarily for beef production, constitute the beef sales. The calves are sold either to local grazers who fatten them and sell them at the end of the grazing season, or to others who may keep them over into their second year. While the diary herd is in the mountains milk is retailed to campers around Lake Tahoe. Two residences on the lower ranch and the summer home and bunkhouse on the upper ranch provide shelter for the family and help. The net farm income, nearly $4000 [in 1930], represents the returns to the operator for his labor, management, and interest on his net investment of about $57,000 in land, buildings, livestock, automobiles, and equipment. About 68 per cent of the gross income represents milk and cream sales, one-fourth of which was cream, the remainder being sold milk. Beef sales represent 29 per cent of the gross income; while sales of hogs and wood make up the rest...This farmer and his family...enjoy their summer in the mountains and their winter in the valley. It is doubtful if they are seeking a change in their way of living. The experience of this farmer represents one of a number of cases where a rancher with a prior right to a choice bit of mountain range, an early start in a growing milk trade among the summer campers, and business ability, has been able to make real progress in the extreme western part of the county" (Weeks, 1934:45-47).

Conversations with Barton relatives and friends, and the oral history recollections of Alva Barton (the senior surviving member of the family) provide general insights into Tahoe aspects of Weeks' "migratory dairy and beef enterprise" ranching system. Excerpts follow; however, as Del Laine notes (2002), ranchers did not interact very much as they were consumed with responsibilities of running their own operations; therefore, they remember events about each other in generalities.

In the early days every rancher needed a winter range, either in the California foothills or in the Carson Valley ("Alva Barton Oral History", n.d.). Mountain meadows were used in the summer months. When the grass turned dry in the lower foothills, cattle were moved into the Tahoe Basin for the summer. Cattle opened the roads over the summits in the lingering snow by tramping down the snow; in turn, cattle were driven out with the first snow (Del Laine, 2002). The trip took several days and logistics involved packing the family belongings (including hogs and chickens) and arranging for stopping places with corrals along the route. Alva Barton recalls traveling from Lake Tahoe down the Highway 50 corridor; Bartons would spend the first night at "Phillips" (near the summit), the next night at Kyburz, and stopping at two more camps before reaching Shingle Springs for a fourth night. In June, it took about a week to come up the hill.

> "…And then you just camped along the road in tents…along the way Mama had to make lunch, that was a must. She would cook for days: cakes, applesauce cakes, ham, cheese, you name it. We came along the way and picked up the little calves along the way that would get lost and what not. Then we ate lunch. But Mama, before she was married, she would drive pigs…" (Alva Barton Oral History, n.d.).

Although in the mountains, meadows still had to be irrigated later in the season (M. Mosher, 2002). This was accomplished through a network of water impounding and diverting dams and wing walls, water gates, and miscellaneous earthen water works. Johnson family members were pioneers in Lake Valley irrigation endeavors and introduced the practice of irrigation to other ranchers. Here, irrigation enabled ranchers to extend the grazing season beyond mid-July to mid-September. Creeks in Lake Valley, were seasonal, running dry about mid-summer. Ditches were cleaned of duff and debris by hand every spring. Ditches were shut-off about mid-September (Johnson, 1996 in Lindström and Hall, 1998).

To further enhance pasture production, stock was periodically moved. For example, when the upper meadows along the middle reach of the Upper Truckee were low on grass, stock was located to the meadows along the lower reach of the Upper Truckee (at Meadowedge). In recent times, the Barton's (now Mosher's) grazing practices have been modified by local regulation, wherein, their once large expanse of pasture has been divided into six smaller fenced pastures whose fields are sequentially rotated. This shift in grazing strategy, along with other factors, has shortened Mosher's summer grazing at the lake by several weeks. Stock was not traditionally moved to the lower elevations until mid October (M. Mosher, 2002).

Several pioneer ranching and diary families in the Tahoe region had land holdings within or near the Upper Truckee River drainage, namely Hiram Barton, Carlo Guisseppi Celio, Harry Comstock, H.F. Dangberg, W.F. Dressler, John Dunlap, Chris Johnson, Melville Lawrence, and R.A. Trimmer. In some cases, family ownership dates back to homesteads acquired in the 1860s; for most, however, lands were purchased as cut-over timber holdings in the early 1900s.

The Barton Ranch: The Barton family grazed dairy cattle within the floodplain of the middle and lower reaches of the Upper Truckee River floodplain. The bottomlands south of the Upper Truckee River's outlet (formerly known as `Lake Stream') and north of the

Highway 50 crossing of the river were known as "Meadowedge" (Scott, 1957:209).

> “Although Hiram `Hy' Barton's Ranch, situated in the first meadow north of Yank's (Meyers) with the Upper Truckee River running through the holding, was not strictly considered a way station in the 1860s, it supplied feed for the freighting teams and dairy products to the traveler, serving also as a lodging house when other establishments on the Lakeshore leg of the Johnson cut-off were filled to capacity. Homesteaded by cattleman Hiram Barton, who came to California in the 1850s, it served as his Lake Valley `home ranch' during the summer season” (Scott, 1957:379).

Hiram Barton was one of Lake Tahoe’s earliest pioneers, rancher/dairymen, and large landowners. He was born in New York. According to Alva Barton (“Alva Barton Oral History”, n.d.), her grandfather later came to California arriving at White Rock (western El Dorado County) on the train that brought the news of President Lincoln’s assignation (“Alva Barton Oral History”, n.d.). Hiram Barton owned over 3000 acres at the lake, as well as another 580 acres in Hope Valley, Alpine County (Alva Barton Oral History, n.d.). He wintered in Sacramento area and served as Deputy Sheriff of El Dorado and Sacramento counties, Supervisor for two terms and School Trustee for seven years in the district that he lived. At one time he was noted as a breeder of fine horses. Hiram Barton married Margaret Skippinton and together they had 11 children (nine according to Scott, 1957:397), including sons William Delos and Timothy Guy Barton (“Alva Barton Oral History”, n.d.). The two Barton brothers continued the family ranching tradition at Lake Valley.

> “Hiram Barton was the father of two girls and seven boys and one of his sons, William Delos Barton, was still active in the cattle business in 1955 with his headquarters at the Tahoe Valley Y...One of Hiram's brothers, Timothy Guy Barton, settled on meadowland to the northeast, his ranch later being acquired by Samuel Kyburz. Hiram Barton's holding was purchased by the J. Chester Scott family, formerly of Deer Park Springs (Scott, 1957:379).

W.D. Barton (Alva Barton’s father), developed ranchlands in the river’s middle reach and surrounding the present airport site. W.D. Barton married Ouida Kyburz, daughter of Samuel Kyburz. According to Alva Barton (“Alva Barton Oral History”, n.d.), Samuel Kyburz was the first “white” child born at Sutter’s Fort and later became a financial secretary, advisor and surveyor for Sutter. His associations with John C. Fremont and Donner Party’s George Donner ascribe him further fame. Ouida (Kyburz) Barton’s brother, George Kyburz, married wife, Minnie, and the two ranched lands adjoining the Barton’s and containing the site of the Lake Tahoe Airport.

W.D. Barton acquired land in the vicinity of the airport ca. 1913 (Alva Barton Oral History n.d.). He supplied dairy products to the Lake Valley Railroad (Lindström and Hall, 1998:Table j) and his name also appears on the railroad payrolls (Lindström and

Hall, 1998:CTLFC Records 1864-1846 NC72/7/Boxes 9&12, NC72/8). W.D. Barton acquired grazing land from the CTLFC in 1922 and 1926 (Lindström and Hall, 1998:Figure Y). Alva Barton ("Alva Barton Oral History", n.d.) recalls that the family ran milk products to Berkeley Camp, YMCA and Camp Sacramento. They also had a milk route around Al Tahoe and furnished Globin's Resort, Tahoe Meadows, Camp Chinokis, and the former 4H camp near present-day Stateline. The number of cows varied between 175 and 300 supplying two milk ranches, one at Meadowedge and one at Lyons old ranch near the airport ("Alva Barton Oral History", n.d.). The latter property was originally owned by the Lyons family (Figure III.J.7) and was purchased by W.D. Barton (figures III.J.8 and III.J.9b) around the turn of the century (Ledbetter, 1994 in Lindström 1994). One of the Barton's "old ranch houses" is pictured in Scott (1973:6) during the summer of 1912. Bill Ledbetter, W.D. Barton's grandson, lived at the ranch house near the present airport as a child of six. Melba Ledbetter/Mosher, Bill Ledbetter's sister, does not recall this ranch ever being under Barton ownership. She recalls that the house was torn down later over concerns that children staying at a nearby summer camp ("Camp Towanga") were at risk because of fire or injury (M. Mosher, 2002). At the time the ranch house was bulldozed household furnishings were intact, along with the milk house and corrals. W.D. Barton relocated his home ranch house base near the present-day Wye, where it stands today. It now is the summer residence of Alva Barton.

Like his father, Hiram, W.D. Barton also prized and raised horses. He rented horses for enterprises at Chambers, Echo Lake, Ebrights, and Fallen Leaf Lake. He won a challenge from Anita Baldwin ("Lucky" Baldwin's wife), racing one of his own breeds against her professional racehorse from Los Angeles (Santa Anita Race Track, Baldwin Hills). Barton's horses were also used in the 1930s motion picture extravaganza "Rose Marie", starring Jeanette McDonald and Nelson Eddy ("Alva Barton Oral History", n.d.).

The Bartons were instrumental in establishing permanent medical services at South Lake Tahoe. No hospital existed at Lake Tahoe until the 1960s (*Tahoe Daily Tribune*, 1994:84). The first position for a year-round doctor in Lake Valley was sponsored by a fund-raiser dinner, wherein W.D. Barton donated a steer and Harvey Gross (father of Beverly Gross/Ledbetter, Bill Ledbetter's wife) sold tickets (M. Mosher, 2002). Later, the Barton and Ledbetter families donated six acres east of the Wye, where Highway 50 and 89 divide. With donations and matching grants, locals were able to build the first community hospital. Barton Hospital is still in the process of expanding.

Ranching family ties and land ownership patterns within and adjoining the project area are extracted from a series of historic maps and are summarized below:

Date	*Source*	*Location*	*Owner*
1895	map (Figure J-7)	Section 16, 20, 21	Timothy Guy Barton
		Section 4, 9	Lyons
		(surrounding lands)	CTLFC
1908	map (Figure J-8)	Section 16, 20, 21	Barton Bros
		Section 9	Lawrence & Comstock
		(surrounding lands)	CTLFC
1914	map (Figure J-9b)	Section 4	Chris Johnson
		Section 4, 9	W.D. Barton
		Section 16	Kyburz
		Section 20/21	"Lawrence Dairy"
		(surrounding lands)	CTLFC
1926	map (Figure J-10)	Section 20/21	"Scotts Dairy"

A complex of dirt roads and stream fords recorded throughout the project area interconnected family ranches. These roads provided direct access from the Lake House "dog leg" of the historic Placerville Road. Recorded roads #26, #27 and #28 may be associated with Lyons' ranch works. Road #28 remains on modern topographic maps. Road #13 may relate to a structure in the southeast quarter of Section 4 and shown on a 1914 map (Figure III.J.9a). Road #61 may tie to a structure shown in the northwest quarter of Section 21 and shown on a 1914 map (Figure III.J.9a) and on modern maps. This road may have also served as a shortcut between historic Pioneer Trail and Highway 50.

Irrigation works within the project area are marked archaeologically by a series of water impounding and diversion dams and wing walls, water gates, ditches, and other earthen works. According to Melba Mosher (2002), all dams within the project area predate 1950. W.D. Barton constructed the dams on the Barton Ranch ca. 1940s. At strategic locales, concrete water gates were constructed. W.D. Barton transported gas-powered cement mixers to each construction site (M. Mosher, 2002). Opposing notches in the concrete walls accommodated wooden boards that were lowered or raised to control flows. At gate flood flow, water gradually seeped rather than rushed out into the meadows (M. Mosher, 2002). In earlier days, the main and tributary channels to the Upper Truckee had not eroded to their present grade. Higher levels of the channel bed facilitated irrigation efforts using shallow dams, water gates, ditches and other water works. At times, the entire meadow was irrigated, using all channels (B. Mosher, Sr., 2002). Water gate construction characteristics, as observed archaeologically, are discussed in the survey results section of this report.

The dam shown on a 1956 map (Figure III.J.12) located in the south part of Section 4 may represent either dam #8 or #18 as recorded in this study.

A second dam, shown on the 1956 map (Figure III.J.12) near the center of Section 9 was locally known as the "Camp Tawonga Dam." The dam was destroyed to make way for the airport runway extension (B., Sr. and M. Mosher, 2002). The dam/bridge is depicted on Plate J-2. When the boards were dropped to back water up to irrigate the meadows, the pond formed behind the dam was large enough to draw children from Camp Towanga for canoeing (B., Sr. and M. Mosher, 2002). After the dam's destruction, El Dorado County replaced it with a new dam north of the airport runway. This replacement dam may represent either dam #8, #18, or possibly #19 (if the latter is, indeed, a dam and not just a stream ford.) The new dam never worked properly. Boards continually floated up out of their notched positions and it was eventually washed out (M. Mosher, 2002).

A third dam is shown on the 1956 map (Figure III.J.12) in the southern part of Section 9 and probably represents #32 recorded during this survey. George and Minnie Kyburz may have constructed this dam during their tenure on property now occupied by the airport (M. Mosher, 2002).

All three dams appear on the 1961 map (Figure III.J.14), which curiously has not been updated to show the airport. Dam #32 and either dam #8 or #18 again appear on modern maps.

Fishing
Brewer wrote in l863 (p. 443):

> The lake [Tahoe] abounds in the largest trout in the world, a species of speckled trout that often weighs over twenty pounds and sometimes as much as thirty pounds!

The two great lakes joined by the Truckee River – Lake Tahoe and Pyramid Lake – are the only lakes within the Lahontan drainage system of the western Great Basin that did not dry up over the past 10,000 years. While fisheries within other water bodies of the Lahontan system were depleted, Lake Tahoe retained an extraordinarily productive and stable native fishery for thousands of years (Lindström, 1992, 1996). Fish constituted one of the most important subsistence resources for the Washoe and their prehistoric ancestors (Lindström, 1992, 1996), with the Upper Truckee River rated as the prime fishery in the basin. Yet, in a matter of decades, the native fishery – once blithely regarded as inexhaustible – was reduced to a fraction of its former abundance, and the Lahontan cutthroat trout became extinct.

The delivery of two whaleboats to the south end of Lake Tahoe in 1858 marked the beginning of commercial fishing here. As soon as the Comstock opened in l859, commercial fisherman in small boats hauled in thousands of native cutthroat trout, which were marketed as far as San Francisco and Chicago. Native Americans reportedly netted large numbers of fish throughout the year and these were sold to local innkeepers. Juday's (1906) data suggest that sport and commercial catches at Tahoe approached 75,000 pounds in good years (Cordone and Frantz, 1966). Harvesting methods were wasteful.

The industry produced food for the local communities and settlements outside the basin until 1917, when the California legislature banned commercial fishing at Tahoe. Since the 1860s excessive commercial fishing, dam construction, disturbance of spawning grounds, obstruction of spawning runs, pollution of the watershed, and competition from introduced species combined to cause the demise of the native cutthroat trout (Lindström, 1992, 1996; Townley, 1980). By 1929 the cutthroat trout could no longer migrate up the Truckee River and by 1938 both Tahoe and Pyramid lakes strains of cutthroat trout were extinct.

Water Quality

Mark Twain appears to have had poor luck luring the large Tahoe trout to his bait, as the crystal clear waters exposed his fishing line. Twain was greatly impressed by Tahoe's extraordinary clarity. Adrift on a small boat along Tahoe's shore, he found Tahoe's water to be as transparent as Tahoe's air (Twain, 1962). "So singularly clear was the water…where it was even eighty feet deep…So empty and airy did all spaces seem below us, and so strong was the sense of floating high aloft in mid-nothingness, that we called these boat excursions 'balloon voyages'."

The high level of water clarity and quality is one of Lake Tahoe's most notable characteristics. Early on, sawdust and slash contributed to the degradation of water quality in lakes and streams, and growing human populations have continued to pollute the lake's water with the introduction of minerals and organic substances (Goldman and Byron, 1986; Heyvaert, 1998) have detected two distinct periods of disturbance, as measured by a surge of organic deposits. One coincides with historic clear-cutting between the 1870s and 1890s, and the more prominent other episode of mass sedimentation correlates with the tenfold increase in the population of the Tahoe Basin since 1960. The sediment data suggest that the lake's water quality recovered rather quickly when clear-cutting ceased, unlike the chronic and sustained effects of erosion caused by post-1960s urbanization.

Recreation-Tourism

With the demise of logging, title to cut-over land sections in the Tahoe Basin was obtainable by paying the back taxes or, at the most, $1.50 an acre. This lead into an era of resorts and summer home subdivisions (Scott, 1957:219). People of more modest means vacationed in rustic hotels and cottages or camped which was more spartan facilities than their late 19th and early 20th century elite counterparts who vacationed at elegant resorts. Tahoe's backwoods were explored and enjoyed by increasing numbers of recreationists. Two youth recreational camps, "Skylake Camp" (figures III.J.12 and III.J.13) and "Camp Tawonga" (Figure III.J.13) were once located on the west side of the river and due north of the airport. Both camps were shut down with the runway expansion after 1963 (M. Mosher, 2002).

The 1930s saw the legalization of gaming at south shore and the opening of small ski resorts. Thus the movement toward year-round use of the Tahoe Basin brought building and development to Tahoe's shores, with the need to house employees not only vacationers. The close of World War II opened the door to wholesale land development on the south end of the lake. With Tahoe's thriving recreational economy, a critical growth threshold was crossed. By the 1950s, discussions on water and sewage problems occupied more space in Tahoe's local papers. By the early 1960s, Tahoe planners were talking in terms of a "saturation population", expected to occur in about 2010, when all useable land was occupied and no new growth could occur (LTAC, 1963:27-28).

In this context of urbanization and rapid growth, the modern era of regulated regional planning began. Since that time, opposing philosophies and values on growth, diversity and the area's economic and environmental well-being have been inevitably tied to regulations imposed by a legion of review agencies whose mandate to protect the environment is often at odds with private enterprise, prompting what Van Etten (1987:22) has termed the "attack of the alphabet soup" (TRPA, CTC, TRCD, NRCS, etc.). In recognizing the very complexity of this web of relationships among the elements of social well being, economic vitality, and environmental quality, the CTC, TRCD and NRCS have acknowledged their role in restoring and maintaining the health of the Lake Tahoe Basin by sponsoring the environmental program for the improvement, restoration and rehabilitation of the Upper Truckee River. The CTC, in particular, has been involved in efforts to purchase and restore environmentally sensitive lands, especially wetlands and sites of significant erosion like the Upper Truckee River corridor.

Lake Tahoe Airport.

To accommodate community development and the influx of visitors in the post-Comstock era, travel networks were expanded throughout the basin. The State of California authorized the survey of new roads over Echo Summit in 1895 and over Donner Summit in 1909. Motorized vehicle traffic increased after 1913, with the nation's first transcontinental road, the Lincoln Highway. It routed along Tahoe's south shore (along the historic Pioneer Trail). By 1925 an auto road circled the lake. Paving of Highway 50 (along with other Tahoe roads) during the 1930s further opened the area. Highway 50 was maintained year-round after World War II, bringing most people to the south shore.

Airplanes began landing in the Tahoe Basin in the 1930s at Pope Meadow in the Upper Truckee Marsh near the Tahoe Keys. Accidents and other factors turned pilot attention to Rabe's Meadows near Stateline, even though landing there meant dodging cows in the meadow. This dirt strip near Stateline allowed small plans to land. Seaplanes landed on the lake as early as 1935 (*Tahoe Daily Tribune,* 1994:84). Air travel also became a popular way to reach the basin, landing DC-3s full of tourists at the Sky Harbor Airport along Tahoe's southeast shore at the present site of the Lakeside Inn. The first official airstrip was opened in 1946 by Tom Kiernan but the perils of landing and taking off at the Sky Harbor locale prompted the FAA to officially close down the airstrip in 1948; however, it continued to operate at pilot's risk. So began construction in 1959 of a larger and safer airport along the middle reaches of the Upper Truckee River on land taken in condemnation from the Barton family's large dairy farm (Laine, 2002). Harvey Gross bought the land and local citizens spearheaded the effort. The airport was temporarily called Kyburz-Barton-Tahoe Airport for fund-raising reasons (*Tahoe Daily Tribune,*1983:5G-6G).

Lake Tahoe Airport was built with an original runway 6000 feet long and 75 feet wide. Soon the airport was serving 16 flights a day, with Golden Gate Airways being the first daily commercial flights into the airport in 1960, followed by TWA and Paradise Airlines. To accommodate the growing tourism industry and larger aircraft, the runway was extended in 1963 about 2500 linear feet in Section 9 to its current size of 8544 feet long by 150 feet wide (Oliver, 2002). To accomplish this, the Upper Truckee River channel was relocated and straightened. Pacific Airlines began service in 1963 and Hughes Airwest and Holiday Airlines followed by 1965. The airport tower was completed in 1965. During the 1960s, the airport terminal was housed in an old Army Quonset hut until the present terminal was constructed in 1970. Consistent and steady growth of air traffic continued through the late 1970s. However, financial difficulties in the 1980s forced its acquisition by the City of South Lake Tahoe for one dollar. Because of operating costs and noise abatement rules, there were only two commercial airlines using the airport by 1985.

A master plan for further airport developments has been proposed. Many small planes use the airport and the search for additional commercial jet service continues.

Sunset Ranch.

Sunset Ranch falls on property that was part of the original Barton holdings and later acquired by the Kyburz family. A 1908 map (Figure J-8) shows the land under Barton ownership, while a 1914 map (Figure J-9b) lists it as Kyburz. George and Minnie Kyburz established ranch headquarters and built a brick home, located on the same site as the former Sunset Ranch residences (Laine, 2002).

III.J.4 Environmental Consequences

III.J.4.1 Heritage Resource Summary

Sixty-six heritage resources were inventoried during the archaeological field survey. They are briefly described below (by reach number) and locations appear on the Heritage Resource Location Map in the attached confidential appendix (filed separately from the public document). Locales are also plotted on over-sized project location maps at 1”=100’ scale (also filed separately from the public document).

Heritage themes involve Native American land use and Euroamerican water management for grazing, transportation, habitation, fencing for boundaries and stock management, and miscellaneous isolated artifacts and features. The total inventory appears on Table III.J.2 and is summarized as follows:

1. Native American:
- 8 pieces of debitage (waste flakes)
- 3 bedrock milling features
2. Water Management:

- 7 dams
- 4 water gates
- 2 culverts
- pipe fragment
- irrigation ditch
- miscellaneous earthen water diversion works

3. Transportation:

- 6 dirt road systems
- 7 stream fords

4. Habitation:

- 2 refuse deposits

5. Fence Line:

- 8 fence line complexes
- fence posts

6. Miscellaneous Isolated Features and Artifacts

III.J.4.1.1 REACH 1-6

1-fence line with three rows of double strand barbed wire wrapped around double trunk lodge pole (25-30 inches DBH and five feet high) and joining stamped metal "T" posts and split cedar posts; wire is set by rounded staples and nails; fence trends 120° at the project's north boundary and bounds the Upper Truckee Meadow on the east throughout the project area; fencing and posts are variably intact; overall, three generations of fencing occur within the project area, (1) first, split cedar posts; (2) next, stamp-metal "t" posts, and (3) last, round logs; the fence line has been individually modified by private riverfront land owners; fence line is approximately plotted on heritage resource location map and exact locations and descriptions await formal recording

12-assorted historic cut stumps are mainly located in forested lands throughout the project area; stumps are noted as a resource group but not assigned individual map plots

III.J.4.1.2 REACH 1

2-fence line intersects fence line #1 on a 30° trend; barbed wire is bound to 6-inch diameter posts; the fence forms a barrier to foot traffic and may be recent; posts are set perpendicular to the river

3-cast iron utility (gas?) pipeline is submerged in the river; it trends 223°; a utility line parallels the pipeline overhead (utility pole #372 to the east)

4-fence line is marked by five stamped "t" posts and serves to either define property boundaries or limit public access; posts are spaced less than three feet apart and are perpendicular to the river

5-brick fragments extend from a private home down to the river, at which point a 6"x6" milled wood beam is embedded in the river bank

6-three anomalous pit depressions occur 15 yards east of the boundary fence line (#1) and outside the project area; the southernmost pit appears as a flat cut into the side of the slope (15'x15'x3' deep); the middle pit is a similar flat cut into the slope (25'x20'x3½'deep); the northernmost pit is round (seven feet diameter) with bermed sides and an accumulation of small-sized tree slash abutting it

7-concrete cover is submerged mid river; the feature is manufactured of poured cement, being two feet diameter and protruding six inches above the river flow

47-prehistoric obsidian waste flake (smoky gray color, 1.5 centimeter diameter)

48-dam (?) and water diversion feature consists of an alignment of cobbles in an abandoned river channel and two earthen berms; the cobble alignment is about 15 feet wide and oriented 90°; it is formed by two sets of cobbles about 20 feet apart; linear earthen berms extend to either side of the cobbles; the east berm trends 100° and is 125 feet long; the west berm trends 56°and is 125 feet long; both berms are about 30 inches high by 6 to 8 feet wide and gently mounded; the feature co-occurs with a series of swales that stem from an old oxbow (?)

49-partly buried concrete culvert/pipe at the bottom of the river measures eight feet long and 36 inches diameter

50a & b-two irrigation water gates appear as concrete box structures on the east and west branches of a fork in an abandoned river channel; the easterly water gate is more in tact than the westerly one and measures three feet high, 3½ feet wide and 3½ feet long; it is reinforced with threaded ½-inch steel rods; poured concrete walls are six inches thick; boards were fitted into a slot in the opposing concrete faces to control water flow; the westerly water gate is collapsed and sunken into the channel but seems to have had similar construction principles; the west gate is about 110 feet from the east gate on a heading of 90°

51-two-inch pipe fragment protrudes from the bank of an abandoned river channel about seven inches below the ground surface; threaded pipe segment is four feet long

*** Table III.J.2: Heritage Resource Summary**

Resource Type	No.	Reach Location
Native American Features		
Obsidian waste flake	14	2 (outside project)
Obsidian waste flake/quartz chunk	15	2 (outside project)
Chert waste flake	23	2 (outside project)
Basalt waste flake	25	3 (outside project)
Obsidian waste flake	29	3 (outside project)
2 bedrock milling features	34	5 (outside project)
Obsidian waste flake	47	1
Bedrock milling slick	58	4
Obsidian waste flake	62	6
Water Management Features		
Dam and diversion wall	8	2
Dam (and bridge)	16 (& 17)	2
Dam and diversion wall	18	2
Dam (and/or stream ford?)	19	2
Dam (and/or stream ford?)	26	3
Dam	32	4
Dam	33	4
Culvert/pipe	45	2
Earth water diversion works	48	1
Concrete culvert	49	1
Concrete water gate	50a	1
Concrete water gate	50b	1
Pipe fragment	51	1
Irrigation ditch	53a	1
Concrete water gate	53b	1
Concrete water gate	54	1
Transportation Features		
Dirt road	13	2 (outside project)
Dirt road (bridge and dam?)	17 (& 16)	2
Stream ford (and/or dam?)	19	2
Dirt road	22	2 (outside project)
Stream ford (and/or dam?)	26	3
Stream ford (and dirt road)	27 (and 28)	3
Dirt road (and stream ford)	28 (and 27)	3
Stream ford (?)	30	3
Stream ford (?)	31	3
Stream ford	36	5
Stream ford	37	5
Stream ford (and dirt road)	60 (and 61)	6
Dirt road and stream ford	61 (and 60)	6
Dirt road	63	6

* Table III.J.2 Heritage Resource Summary (cont.)

Resource Type	No.	Reach Location
Habitation Features		
19th century refuse deposit	20	2 (outside project)
Glass and ceramic fragments	24	3 (outside project)
Fence Line Features		
Fence line	1	1-6
Fence line	2	1
Fence line	4	1
Fence post	9	2 (outside project)
Fence line	11	2 (outside project)
Fence post	39	5
Fence post	40	5
Fence posts	41	4-5
Fence post	43	3
Fence posts	44	2
Fence line	52a	1
Fence line	52b	1
Fence line	57	4
Fence line	67	5
Miscellaneous Isolated Features		
Pipe line	3	1
3 pit depressions	6	1 (outside project)
Concrete cover	7	1
Tree blaze	10	2 (outside project)
Historic cut stumps	12	1-6
Footbridge with utility conduit	21	2
Cast-iron pipe fragment	35	5
4x4 post	38	5
Cattle feeder	55	1
“I” beams in concrete foundations	56	1
Deeply eroded gully	59	4 (outside project)
Wood/metal angle iron structure	65	6
Concrete block	66	6
Miscellaneous Isolated Artifacts		
Brick fragments	5	1
Historic bottle fragment	42	4
Strap metal	46	2
Flotsam/jetsam	64	6

* numbered heritage resources are keyed to heritage resource location maps; plots for #1 are approximate and incomplete and await formal recording phase (Phase 1b); #12, historic cut stumps are noted but not individually plotted

52a & b-historic <u>fence line</u> parallels an existing fence; 52a trends north-south and consists of split cedar posts with field fencing attached with staples; one old weathered post has a small cut spike or nail at its top; two other cedar posts, spaced about eight feet apart, contain wire nails, baling wire, fence staples and a few cut nail remnants; a few stamped-metal “T” posts indicate on-going use and repair; 52b bears east-west along a linear ditch (#53a) and ends 30 feet west of a concrete water gate (#53b);

53a and 53b-<u>irrigation ditch and water gate</u>; the irrigation ditch (#53a) is about 350 feet long and up to 12 feet wide and as much as two feet deep; much of the trench is now choked with willow; fence #52b runs along the southerly berm of the ditch; the water gate (53b) appears as a concrete-lined spillway (33 inches wide) bordered by two concrete walls (72 inches long by 35 inches wide and 30 inches high); slots in the concrete walls would have accommodated wooden boards that could be inserted or removed to control water flow; ½-inch threaded steel rods extend from the top of the walls; a pile of lumber (containing 20, 6x6, 2x12, 2x6 boards with wire nails) is randomly stacked in an abandoned channel nearby

54-concrete <u>water gate</u> measures 20 feet long, 7½ feet wide and 30 inches high; its long axis trends 320°; the feature is reinforced with threaded ½-inch steel bolts; a large willow has grown up inside the water gate, causing parts to fall but it still remains in tact

55-<u>cattle feeder</u> appears as an orange-painted, arrow-shaped wood and metal feature; it stands five feet high, 45 feet long, with arrow barbs each 24 feet long; it is constructed of two-inch diameter galvanized metal posts spaced four feet on center and wooden slats; the feature is oriented 340°

56-“I” beams in concrete near lower Upper Truckee River/Hwy 50 bridge; a truncated I-beam alignment is set in poured concrete with four footings spread over 30 feet; the feature trends 164°; the beam nearest the river stands five feet high; the others are torch-cut at the ground level; beams are 12 inches wide and made of ¼-inch welded steel; the feature begins 30 feet south of the bridge and may relate either to an earlier bridge or other water control engineering activities

III.J.4.1.3 REACH 2

8-<u>irrigation dam with earthen water diversion</u> wall is strategically located at the convergence of two main channels of the river; the dam is formed of concrete (eight inches thick); remains stand about six feet tall on the west side of the river; its section, parallel with the river’s flow, is about 24 feet long, with four-foot concrete wings on either side; another section, about 12 feet long, lies down slope and to the east; more concrete chunks are located upslope of the main dam and to the west and partly obscured by willows; a raised earthen berm (30 inches high and 10 to 12 feet wide) extends about 525 feet to the west of the river and into the meadow; the berm trends 270° and is four to nine feet wide and 1½ to 2½ feet high; it served to divert water from the river into the drying grassland; a pool, north of the dam, has been enhanced by a beaver dam; the dam is on property owned by Lyons (as shown on a 1895 map) and on Lawrence and Comstock land (as shown on a 1908 map); the date that Barton's acquired the land is not known; W.D. Barton constructed dams on Barton property ca. 1940s (B., Sr. and M. Mosher, 2002); this dam (either 8, 16, 18, or 19) was constructed ca. 1959 by El Dorado County to replace the "Camp Tawonga Dam" that was located in the airport alignment; (the "Camp Tawonga Dam" was constructed by W.D. Barton ca. 1940s and is shown on Plate J-2 and Figure J-13); the county dam proved to be ineffective and did not serve Barton irrigation interests well (B., Sr. and M. Mosher, personal communication 2002); the dam (either #8 or #18) appears on a 1956 map (Figure J-12)

9-fence corner post has been constructed of a modified railroad tie; the tie has been sharpened and notched and is wrapped with barbed wire

10-a axe-marked old lodge pole pine (40-inch DBH) contains two blazes; the blaze on the east side of the trunk is nine inches tall, the blaze on the south-facing trunk is 3½ inches tall; both blazes are about 2½ feet above the ground

11-fence line of double strand barbed wire is anchored to an eight-inch DBH Jeffrey pine; the fence line trends 140°

13-road grade trends about 220° up from the south/southeast side of the river to a flat bench; the grade is about 10 feet wide and falls outside the project area; the road is part of a complex that may have access a structure (shown on a 1914 map); a road complex that ultimately accesses the Lake House "dog-leg" of the Old Placerville Road

14-prehistoric obsidian waste flake and quartz chunk (both approximately two centimeters diameter) occur on a bluff above the river and outside the project area

15-prehistoric chert waste flake (about four centimeters diameter) is located on a slope above the river and outside the project area

16-dam/bridge crossing the river is currently in use; the bridge is 14.2 feet wide by 36 feet long; the bridge is all wood construction of 2x6 and 2x12 beams; 2x12 beams run parallel to the creek on top of 2x12 headers that rest on three poured/slip formed concrete piers spaced about eight feet apart; metal "I" beams allow water to be blocked when wooden panels are inserted; a solar panel and flow meter occur on the bridges northwest side; the dam is on property owned by Lyons (as shown on a 1895 map) and on Lawrence and Comstock land (as shown on a 1908 map); the date that Barton's acquired the land is not known; W.D. Barton constructed dams on Barton property ca. 1940s (B., Sr. and M. Mosher, 2002); this dam (either 8, 16, 18, or 19) was constructed ca. 1959 by El Dorado County to replace the "Camp Tawonga Dam" that was located in the airport alignment; (the "Camp Tawonga Dam" was constructed by W.D. Barton ca. 1940s and is shown on Plate J-2 and Figure J-13); the county dam proved to be ineffective and did not serve Barton irrigation interests well (B., Sr. and M. Mosher, 2002); the dam appears on modern maps

17-a <u>dirt road</u> crosses the dam/bridge #16 at an approximately 290° angle; the grade is 10 feet wide; a road complex that ultimately accesses the Lake House "dog-leg" of the Old Placerville Road

18-<u>irrigation dam and diversion wing wall</u> once diverted water southwestward into the meadow; dam remains include poured/slip formed concrete (4½ feet high and 12 feed wide), intermixed with earth and wood foundations; the dam trends 215° and is located at the edge of the current airport fence; the diversion wing wall is a poured concrete structure extending westerly (185°) into the meadow; wall construction is reinforced with iron pipe and heavy strap metal; problematical linear containment bays are located along the wall and nearer the river; this dam (either 8, 16, 18, or 19) was constructed ca. 1959 by El Dorado County to replace the "Camp Tawonga Dam" that was located in the airport alignment; (the "Camp Tawonga Dam" was constructed by W.D. Barton ca. 1940s and is shown on Plate III.J.2 and Figure III.J.13); the county dam proved to be ineffective and did not serve Barton irrigation interests well (B., Sr. and M. Mosher, 2002); the dam (either #8 or #18) appears on a 1956 map (Figure III.J.12).

19-<u>dam (stream ford?)</u> consists of a series of moss-covered 2x12s that lie on the river channel bed; planks are about 14 feet long and form a platform 18 to 20 feet wide; rock shoring appears on the southeast bank of the river with fragments of milled timbers embedded into the bank slope; farther north, three 4x4 posts are set into the bank, secured by a 2x12 plank; a few more wood fragments are located downstream; riprap occurs nearby; little remains of the feature and its status as a dam or stream ford is problematic; the point in the stream is an unlikely area for a stream crossing, yet, feature remains are not characteristic of a dam

20-<u>19th century refuse deposit</u> is widely dispersed over a southwesterly facing knoll; about a dozen items include crushed kerosene cans (9"x9"x14"), 1-inch wide barrel hoops, hole-in-top food cans; the deposit may relate to Comstock-era logging activities along the river

21-a <u>wooden footbridge that carries utility conduit</u> is located at an abandoned stream tributary to the river; stream bank riprap is located downstream from the footbridge on the north/northwest bank

22-a <u>dirt road</u> extends southwest of a road complex that ultimately accesses the Lakehouse "dog-leg" of the Old Placerville Road

23-<u>prehistoric chert waste flake</u> (reddish-brown color) is eroded out the cut-bank above the river; it may be associated with the multi-component site recorded on the flat above by Lindström (1994)

24-one piece of historic amethyst <u>glass and</u> a <u>ceramic</u> 'hotel ware' fragment (decorated with two narrow green bands); <u>artifacts</u> may be associated with the multi-component ranching/prehistoric site recorded on the flat above by Lindström (1994); the ranch building was part of the historic Lyons/Barton ranches and may date to at least 1895

44-a series of five fence posts and corner post heads northwesterly (354°) from the river bank and may correspond to a fence corner post located on the east side of the river; posts are 15 feet apart and link up with modern fencing

45-culvert/pipe is located in the meadow; the segment is 20 feet long and 24 inches diameter and trends north-south; the pipe is packed between chunks of poured concrete; pipe is corrugated and galvanized and crushed

46-strap metal banding fragment, 15 feet long by one inch wide lies in the meadow

III.J.4.1.4 REACH 3

25-prehistoric basalt waste flake (fine-grained); is eroded out the cut-bank above the river; it may be associated with the multi-component site recorded on the flat above by Lindström (1994)

26-stream ford (?) consists of two granite boulders (4 to 5 feet diameter) enhanced by numerous smaller cobbles covering an area approximately 15 feet wide; both stream banks are rip-rap at this point; little remains of the feature and its function as a ford is problematic

27-stream ford constructed of poured slip/formed concrete with river cobbles cemented in the matrix; concrete is about 30 inches thick and 20 feet wide; the ford carries dirt road (#28) across the river;

28-dirt road is carried across the river by ford (#27); the road intersects the river at a trend of about 263°; the road is nine feet wide; it is tarred and changes from tar to poured cement as it slopes toward the river; the road now accesses the airport but may have historically accessed the Lyons ranch house located on the bluff east of the river; the road is part of a road complex that ultimately accesses the Lake House “dog-leg” of the Old Placerville Road to the east; prior to airport construction, the road may have once continued westward to intersect the Wye at South Lake Tahoe

29-prehistoric obsidian waste flake (1.5 centimeters diameter, smoky-gray color with cortex platform)

30-stream ford (?) consists of rock alignment in river formed by four boulders (three feet wide) sparsely interspersed with smaller boulders; the feature is not well defined and there is no apparent continuation of rock on either bank or associated roadbed

43-fence post is formed by a cut-off railroad tie and may be part of recent fencing made of stamped-metal “T” posts and barbed wire across the river; four concrete piers (recent) parallel the river bank north of the fence post and may relate to airport activities

III.J.4.1.5 REACH 4

31-stream ford (?) consists of a sparse alignment of large cobbles that span the river channel; the feature is not well defined and there is no apparent continuation of rock on either bank or associated roadbed

32-a large and collapsed concrete dam has been under cut on the river's east bank so that part of the river runs behind or east of the feature; concrete is about six inches thick with four-foot concrete wings on either side; although cracked and partly collapsed, the dam is largely *in situ*; a poured concrete slab (20 feet wide) is downstream of the dam; below this, a huge boulder is pedestaled in the stream and sits high and dry on the west river bank; the dam trends 200° across the river; the dam appears on modern maps

33-a concrete dam with three-log foundation occurs not far upstream from dam #32; its east side remains upright and its west side is collapsed; concrete is slip formed being about seven feet high and about one foot wide; four large (15-inch DBH) pines span the creek; they are spaced four feet on center and may have formed a spillway (?); beaver are currently at work on this dam; a cross-river rope swing is rigged at this point in the river; a sign ("be a good neighbor…") is located due west of the dam

41-the detectable start of a fence line commences with a railroad tie wrapped with barbed wire; the tie is milled square and wooden plugs fill the iron spike holes; the post begins a fence line composed of seven more ties that alternate with stamp-metal posts trending at a 45° angle

42-3 artifacts consisting of one amethyst bottle fragment (with cork closure and double bead finish), two pieces of 'hotel ware' and one semi-porcelain fragment; artifacts are located in a highly disturbed area near the airport fence

57-fence line with barbed wire and stamp-metal "T" posts trends north-south; yellow signs on the fence identify it as a boundary between federal and private land

58-prehistoric bedrock milling slick containing two milling surface bounds the south edge of the river; the boulder is seven meters long by 5.2 meters wide; milling surfaces are poorly defined but definitely worked; the southernmost slick measures 15 centimeters by 12 centimeters; the northerly slick is 11 centimeters by 14 centimeters; there is a possible third slick area, measuring 10 centimeters diameter, located due west of the northerly slick

59-eroded gully trends 210° down a steep slope west of the river floodplain; the trench is 15 feet wide, 100 feet long and a maximum of four feet deep; historical associations are problematical, although at least one "ditch" has been recorded by the U.S. Forest Service on the top of the bluff and in the general vicinity

III.J.4.1.6 REACH 5

34-two prehistoric bedrock milling features (BRMs) are perched on a prominent bluff point above the east bank of the river; the view over the meadow is commanding and impressive; the larger and more westerly BRM consists of a boulder (3 meters long by 1.7 meters high by one meter high) containing at least five mortar cups (and possibly six); the boulder is joined on its precarious and eroded down slope side by another flat, non-worked granite boulder; the smaller more easterly BRM also contains a milling surface, exhibited by flattened and smoothed rock facets and a scarcity of lichen on the apparent work surface; the milling surface measures 20 centimeters (east-west) by 15 centimeters (north-south); the bedrock is two meters long by one meter high by 1.5 meters wide; the granite is more friable than the westerly BRM; another BRM site is located about 1000 feet (300 meters) southeast of #34

35-cast iron pipe fragment, 10 feet long and 10½ inches inside diameter measurement rests about 30 feet from the east bank of the river in an old oxbow obscured by riparian vegetation; the pipe's ends are flanged with 1-inch bolt holes placed 10 inches on center;

36-a possible <u>stream ford (?)</u> is accessed by a linear grade that drops to a shallow and fordable part of the river; the grade is 30 feet long and 10 feet wide and two feet deep; it accesses the river at an angle of 274°; the feature is not well-defined

37-<u>stream ford</u> consists of a cobble and earthen feature about 20 feet wide and 36 feet long and extending most of the river width; the feature is only 12-15 inches in height, being constructed of 12 to 15-inch diameter cobbles, but about 15 large boulders have been placed on the east side of the crossing as rip-rap; rocks are held in place by very thick corrugated steel sheeting appears on the west end of the feature, extending six to 20 inches high; the metal is three feet long and embedded in river sands; another piece of this heavy gauge metal (¼ to ½-inch thick), about four feet long, is incorporated into the east wall of the crossing; a standing galvanized steel pipe (two feet diameter and three feet high) stands near the feature's west side; there is a faint road trace that appears on either side of the crossing that is marked by a sparse scatter of black cinder rock; this probably marks a reclaimed remnant of the northwest-southeast trending (284°) road shown on modern maps

38-<u>4x4</u> milled <u>post</u> stands 30 inches high but is broken at the top; it was once painted white

39-downed split cedar <u>fence post</u>

40-<u>three</u> split cedar <u>fence posts</u> trend 93°; they are spaced about 10 feet apart and cover a linear distance of about 25 feet; posts have wire nails and wrapped baling wire secured by fence staples; they appear to align with the airport fence located to the west; a series of modern metal fence posts (without wire) is located about 15 feet to the north

41-the detectable start of a <u>fence line</u> commences with a railroad tie wrapped with barbed wire; the tie is milled square and wooden plugs fill the iron spike holes; the post begins a fence line composed of seven more ties that alternate with stamp-metal posts trending at a

45° angle

67-rusted barbed wire fencing, tangled and embedded in old lodge pole pines

III.J.4.1.7 REACH 6

60-stream ford formed of concrete, pebbles and cobbles measures about 20 feet wide and 60 feet long and 15 inches thick; it trends 322° across the river; the ford is accessed by a two-track dirt road (#61)

61-dirt road crosses stream ford (#60) at an angle of 322°; it is 12 feet wide; its depiction on modern maps suggests that it may have once served as a short-cut between Pioneer Trail and Highway 50; also, it may have accessed a structure that appears in the northwest corner of Section 21 on a 1914 map; a railroad tie lies in the river channel near the crossing

62-prehistoric obsidian waste flake (smoky gray color, water worn, 2 centimeters diameter)

63-dirt road (overgrown), about 10 feet wide, forms a connector between road #61 and Highway 50

64-flotsam/jetsam in river's overflow channel; an anomalous milled beam and board feature, held together with wire nail spikes, protrudes nine feet from the west bank of the river; there seems to be at least two cross beams on the stream bottom to which are nailed two broken-off upright pieces; the cross pieces are well into the bank and the whole construct seems to have been lodged here for some time; there seems to be no reason for such a construct at this part of the river

65-galvanized metal angle iron structure in river with two arms, each nine feet long, and bolted to three posts 2½ feet high to form an angle of about 80 °; the posts are ¼-inch thick with "L" beams being 2½" x 2½"; the apex of the angle is braced with two short pieces of the "arm" material; the point of the angle faces the river at 250°

66-weathered coarse-mix concrete block in river channel measures 12" x 12" x 8" with embedded and rusted iron post (about 4 inches diameter and three feet long); it rests on its side in the center of the channel

III.J.4.2 Heritage Resource Significance

III.J.4.2.1 Evaluation Criteria

Prior to determining the significance of a heritage resource, it must be formally recorded (typically on State of California archaeological site record forms). This task is outside the current project scope. If project impacts are likely to occur, the significance of the resource must be determined. A determination of significance is commonly based upon the four criteria of eligibility for inclusion in the National Register of Historic Places

(NRHP 36 CFR 60.4). Another federal program that acknowledges significance is the National Historic Landmark Program. The California Environmental Quality Act (CEQA Section 15064.5) has established significance criteria that are modeled after National Register guidelines. California also has a State Register, State Historic Landmark Program and Point of Historic Interest Program that recognize buildings, sites, and objects of local or statewide importance. In the Lake Tahoe Basin, the importance of a cultural resource is also assessed according to Subsection 29.5 of the TRPA Code.

Important considerations in federal, state and regional significance criteria focus upon a heritage property's research potential, uniqueness, and integrity (relative to other heritage resources similar in kind). To possess integrity a resource must retain sufficient physical character so that it conveys an association with prehistoric or historic patterns, persons, designs, or technologies. A significant property must have the potential to contribute important information towards scholarly research, which can then be conveyed to the general public. The significance criteria, summarized below, provide legal and professional guidelines.

Federal Standards: National Register Criteria
According to National Register criteria, the quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association and:

1. That are associated with events that have made a significant contribution to the broad patterns of our history; or
2. That are associated with the lives of persons significant in our past; or
3. That embody the distinctive characteristics of a type, period, or method of construction, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
4. That have yielded, or may be likely to yield, information important in prehistory or history.

State Standards: California Register Criteria
CEQA criteria of significance (Section 15064.5) are one means of determining whether a site is a historical resource. The criteria are modeled upon guidelines established by the NRHP. For the purposes of CEQA, a significant heritage resource is one which:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In general, CEQA provides protection to "historical resources" and to "archaeological resources" that are "important" and/or "unique." An "important archaeological resource" must meet one or more of the above CEQA criteria. A "unique archaeological resource" must qualify under one of the first three CEQA criteria [Public Resources Code Section 21083.2(g)]. Public Resources Code Section 21084.1, which is part of CEQA, provides additional guidelines for the designation and additional protection of heritage resources classified as "historical resources." Resources that must be treated as "historical" are:

- Those resources listed in, or determined to be eligible for listing in, the California Register of Historical Resources;
- Those resources presumed to be historical in the absence of a preponderance of evidence indicating otherwise and that may be included in a local register of historical resources, as defined in Public Resources Code section 5020.1(k);
- Those resources deemed significant pursuant to criteria set forth in Public Resources Code Section 5024.1(g); and/or
- Those heritage resources that an agency, going beyond the minimum call of statutory duty, has freely chosen to consider "historical."

Regional Standards: TRPA Criteria

In compliance with federal and state significance criteria, the Tahoe Regional Planning Agency (TRPA) has also adopted guidelines to determine the significance of cultural properties within the Lake Tahoe Basin as follows.

1. 29.5A Resources Associated with Historically Significant Events and Sites: Resources shall exemplify the broad cultural, political, economic, social, civic, or military history of the region, the state, or the nation, or be associated with events that have made a significant contribution to the broad patterns of history, including regional history. Such resources shall meet one or more of the following criteria:
   - Associated with an important community function in the past;
   - Associated with a memorable happening in the past; or
   - Contain outstanding qualities reminiscent of an early stage of development in the region.
2. 29.5B Resources Associated with Significant Persons: Resources that are associated with the lives of persons significant in history, including regional history, include:
   - Buildings or structures associated with a locally, regionally, or nationally known person;
   - Notable examples, or best surviving works, of a pioneer architect, designer, or master builder; or

- Structures associated with the life or work of significant persons.

3. 29.5C Resources Embodying Distinctive Characteristics: Resources that embody the distinctive characteristics of a type, period, or method of construction, that possess high artistic values, or that represent a significant and distinguishable entity but whose components may lack individual distinction, are eligible. Works of a master builder, designer, or architect also are eligible. Resources may be classified as significant if they are a prototype of, or a representative example of, a period style, architectural movement, or method of construction unique in the region, the states, or the nation.
4. 29.5D State or Federal Guidelines: Archaeological or paleontological resources protected, or eligible for protection, under state or federal guidelines, are eligible.
5. 29.5E Prehistoric Sites: Sites where prehistoric archaeological or paleontological resources, which may contribute to the basic understanding of early cultural or biological development in the region are eligible.

Significant heritage resources are also acknowledged on a number of local registers. Eligibility criteria for the heritage registers generally incorporate the basic tenants of criteria established in the National Register and the California Register. However, these criteria have been modified in order to include a broader range of resources that better reflect the history of California at the local level. For example, the State Historic Landmark Program and the Point of Historic Interest Program also recognize buildings, sites, and objects of local or statewide importance.

III.J.4.3 Anticipated Impacts

Prior to an assessment of impacts on a heritage resource, it must be formally recorded (typically on State of California archaeological site record forms). This task is outside the current project scope.

Once a heritage resource has been recorded and if it is determined significant, effects of a project on the heritage property should be assessed. A property is impacted (or effected) if the project will diminish the integrity of a property's location, design, setting, materials, workmanship, feeling, association, or the quality of data suitable for scientific analysis. In particular, the archaeological remains left by region's ancestral Native Americans require respectful treatment, along with the continued incorporation of contemporary Native American opinions, knowledge and sentiments into the planning process. Federal regulatory impact thresholds are contained in Section 106 of the National Historic Preservation Act and accompanying regulations (36 CFR Part 800). CEQA addresses the significance of impacts on historical and unique archaeological resources in Section 15064.5. Local regulatory thresholds are found in Chapter 29.2 and 29.6 of the TRPA Code. Subsection 64.8 of the TRPA Code protects heritage resources discovered during construction, in that ground disturbance must halt in the vicinity of the resource and TRPA notified so that resource evaluation can be arranged.

In general, several potential project-related effects are most likely to occur within the

Upper Truckee River area. These impacts may result from the disturbance or destruction of prehistoric or historic archaeological sites during project ground disturbance activities, and/or general changes in land use that may affect the integrity of the setting of heritage properties by introducing incompatible visual or audible elements into the setting of a potentially significant resource. In addition, indirect impacts due to increased public access into an area containing a site could result in vandalism. Of further concern are potential impacts to natural resources of importance to contemporary Native Americans, such as traditional plants.

Three alternatives were developed for each of the six project reaches reflecting varying levels of enhancement engendering various levels of impact:

- Alternative 1: no action
- Alternative 2: moderate level of enhancement measures implemented
- Alternative 3: maximum enhancement measures implemented

All of the alternatives developed assume no significant changes in land use. The south Lake Tahoe Airport is an assumed future use, as is cattle grazing.

III.J.4.3.1 Reaches 1-6

Alternative 1. The no action alternative would result in no impacts to heritage resources.

III.J.4.3.2 Reach 1

Alternative 2. Heritage resources #1, 2, 3, 4, 5, 7, 47, and 56 may be impacted by project activities. Heritage resource # 6 is outside project boundaries and is not of concern to project activities.

Alternative 3. Heritage resources #48, 49, 50a, 50b, 51,5 2a, 52b, 53a, 53b, 54, and 55 may be impacted by project activities.

III.J.4.3.3 Reach 2

Alternatives 2 and 3. Heritage resources #8, 13, 16, 17, 18, 19, 21, 44, 45, and 46 may be impacted by project activities. Heritage resources #9, 10, 11, 12, 14, 15, 20, 22, and 23 are outside project boundaries and are not of concern to project activities.

III.J.4.3.4 Reach 3

Alternatives 2 and 3. Heritage resources #26, 27, 28, 30, 31, 42, and 43 may be impacted by project activities. Heritage resources #24, 25 and 29 are outside project boundaries and are not of concern to project activities.

III.J.4.3.5 Reach 4

Alternatives 2 and 3. Heritage resources #32 and 33 may be impacted by project activities.

III.J.4.3.6 Reach 5

Alternative 2. Heritage resources #35, 36, 37, 38, 39, 40, 41, 58, and 67 may be impacted by the project. Heritage resource #34, is outside project boundaries and is not of concern to project activities.

Alternative 3. Heritage resources #57 may be impacted by the project. Heritage resource #59 is outside project boundaries and is not of concern to project activities.

III.J.4.3.7 Reach 6

Alternative 2. Heritage resources #60, 61, 64, 65, 66, and 62 may be impacted by the project.

Alternative 3. Heritage resource #63 may be impacted by project activities.

III.J.4.4 Proposed Mitigation

Once the project alternative has been selected and heritage resources have been formally recorded, specific mitigation measures can be developed. In general, if it has been determined that a project may adversely effect a potentially significant heritage property, then appropriate mitigation measures must be implemented and carried-out. A means to monitor mitigation should also be identified. Prior to project ground disturbance activities, field-related mitigation activities should be implemented in consultation with appropriate federal, state and local agencies and the Washoe Tribe (if appropriate). Mitigation measures can include project modification designed to protect and/or avoid a site. In lieu of project modification, a data recovery program might be implemented.

III.J.4.4.1 Recommendation: Project Modification to Avoid Impacts

Once the final stream restoration alternative has been selected and heritage resources within the area of potential project effect have been formally recorded, project impact assessments can be reevaluated in detail. If adverse impacts still occur, mitigation measures may include the following.

Redesign Project.
Project redesign, involving the selection of an alternative restoration area, is recommended as the preferred alternative in order to avoid all adverse impacts on potentially significant heritage resources.

Establish Protective Buffer.
The areas containing potentially significant resources should be withdrawn from project development. A protective buffer should be placed around their maximum exterior boundaries until adequate mitigation measures have been implemented for their further study. A determination of an adequate buffer zone should be based on a heritage resource-specific assessment and should incorporate the expertise of a professional archaeologist.

Archaeological Monitoring.
Archaeological monitoring during ground disturbing activities by a qualified archaeologist and Native American Consultant (in the case of prehistoric sites) may be necessary to insure that no subsurface artifacts are present outside the established buffer zone. Should subsurface artifacts be encountered, ground-disturbing activities should halt until a qualified professional can assess the situation.

III.J.4.4.2 Recommendation: Mitigate Impacts through Data Recovery - Project Proceeds without Modification

If project redesign is not feasible, then further heritage studies may be necessary in order to recover significant data and mitigate adverse impacts. Mitigation measures might include archaeological test excavations to establish the presence or absence of subsurface artifacts or features, along with focused archival and ethnographic research, photo documentation and mapping, removal of an historic structure, collection of artifacts, recordation of features, or some combination of these tasks. Once the significant information has been recovered, the project may proceed in the vicinity of the resource without constraint.

Mitigation measures may also prescribe the development of an interpretive plan that highlights selected heritage themes that not only celebrate cultural diversity and human ingenuity but enhance community awareness of environmental issues. Project sponsors are strongly urged to pursue the feasibility and compatibility of public interpretation and heritage resource protection and enhancement concerns along with habitat and wildlife restoration, recreation interests, and the practicalities of maintaining a working cattle ranch and urban airport facility.

Native American Values.
During the future revegetation phase of the project, coordination between project botanists and Washoe plant specialists is encouraged in the event that plants of traditional ethnobotanic relevance to the Washoe might be reestablished into the project area. Included as part of the Washoe Tribe's comprehensive land-use plan (Washoe Tribal Council 1994) are goals for harvesting and caring for traditional plant resources in the Lake Tahoe Basin (Rucks 1996:3). The plan aims to reintroduce traditional plant gathering practices and collect oral histories relevant to traditional land and resource use and management.

Historical Values.
The project area contains some of the few remnants of Tahoe's cattle rearing past. While much about this aspect of the region's heritage remains alive in the descendents of the Bartons, Celios, Dunlaps, Johnsons and others, archaeological remnants of these ranching enterprises are also present – ranch houses, milk houses, barns, corrals, fence lines, roads, irrigation water works, etc. While it may seem an anachronism today, it may be possible to keep the ranching tradition alive within the confines of "progress" and environmental protection by closely monitoring reduced-level grazing activities to ensure compliance

with permit regulations. To enhance economic viability of a down-sized ranching enterprise and to preserve the ranch and a piece of the area's history, some remaining ranchlands might be converted into "tourist" working ranches, maintaining a token level lifeway. Although no Barton ranch buildings remain within the project area, fence lines and other aspects of historic stock management remain, along with a complex of irrigation works and roads. At the nearby historic Dunlap ranch, located along the west edge of the lower reach of the Upper Truckee River marsh, the original milk house and outbuildings still stand. Most associated irrigation works on the river's lower reach on the Dunlap ranch have been removed as part of earlier CTC stream restoration efforts along the river's lower reach. However, historic irrigation works on Barton ranchlands along the adjoining middle reach of the river remain (as documented archaeologically during this study). In the river's upper reach and Angora Creek tributary, ranchlands and ranch buildings of the Celio family remain partly in tact. A comprehensive Lake Valley ranching interpretive plan should be developed, integrating archaeological features on both private and public lands. In the event that such an interpretive plan might be established, select irrigation works within the immediate project area should be preserved in place, ones that no longer obstruct or alter the "natural" hydrological regime of the river and that are consistent with the chosen restoration alternative.

III.J.4.4.3 Recommendation: Fortuitous Finds

In the event that any other heritage resources are discovered during project construction activities, project operations should cease in the vicinity of the find and a qualified archaeologist should be consulted to evaluate the situation.

III.J.4.4.4 Recommendation: No Action Required

Non-Significant Resources.
The project sponsor is not legally constrained to avoid impacts to sites that do not meet significance criteria. However, first sites must be recorded and their significance determined. Even non-significant sites should be preserved, if possible.

Resources Outside Project Boundaries.
Heritage resources # 6, 9, 10, 11, 12, 13, 14, 15, 20, 22, 23, 24, 25, 29, 34, and 59 are outside project boundaries and are not of concern to project activities.

III.J.5 Plates and Figures

Plate III.J.1. George Snooks in 1937 at the Mike Holbrook fishing spot on the Upper Truckee River (photo credit: Siskin 90-03)

Plate III.J.2. Upper truckee river and floodplain showing Lake Tahoe Airport and "Camp Tawonga" Bridge: view ca. southwest, ca 1959-1962 (photo credit: Lake Tahoe Historical Society Mack Wardell Collection)

Plate III.J.3. Upper Truckee River and floodplain showing Lake Tahoe Airport; view north-northeast, ca 1959-1962 (photo credit: Lake Tahoe Historical society Mack Wardell Collection

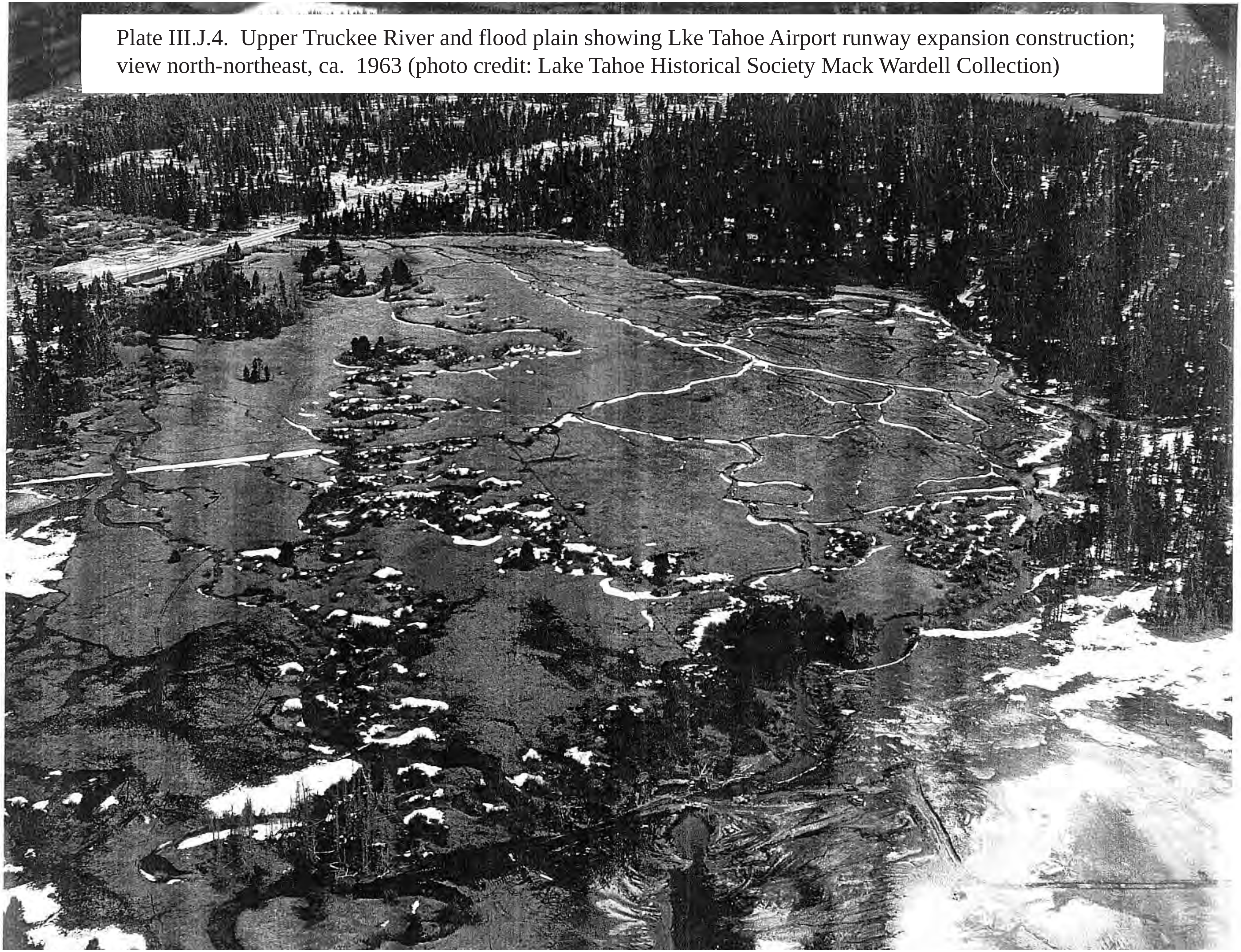
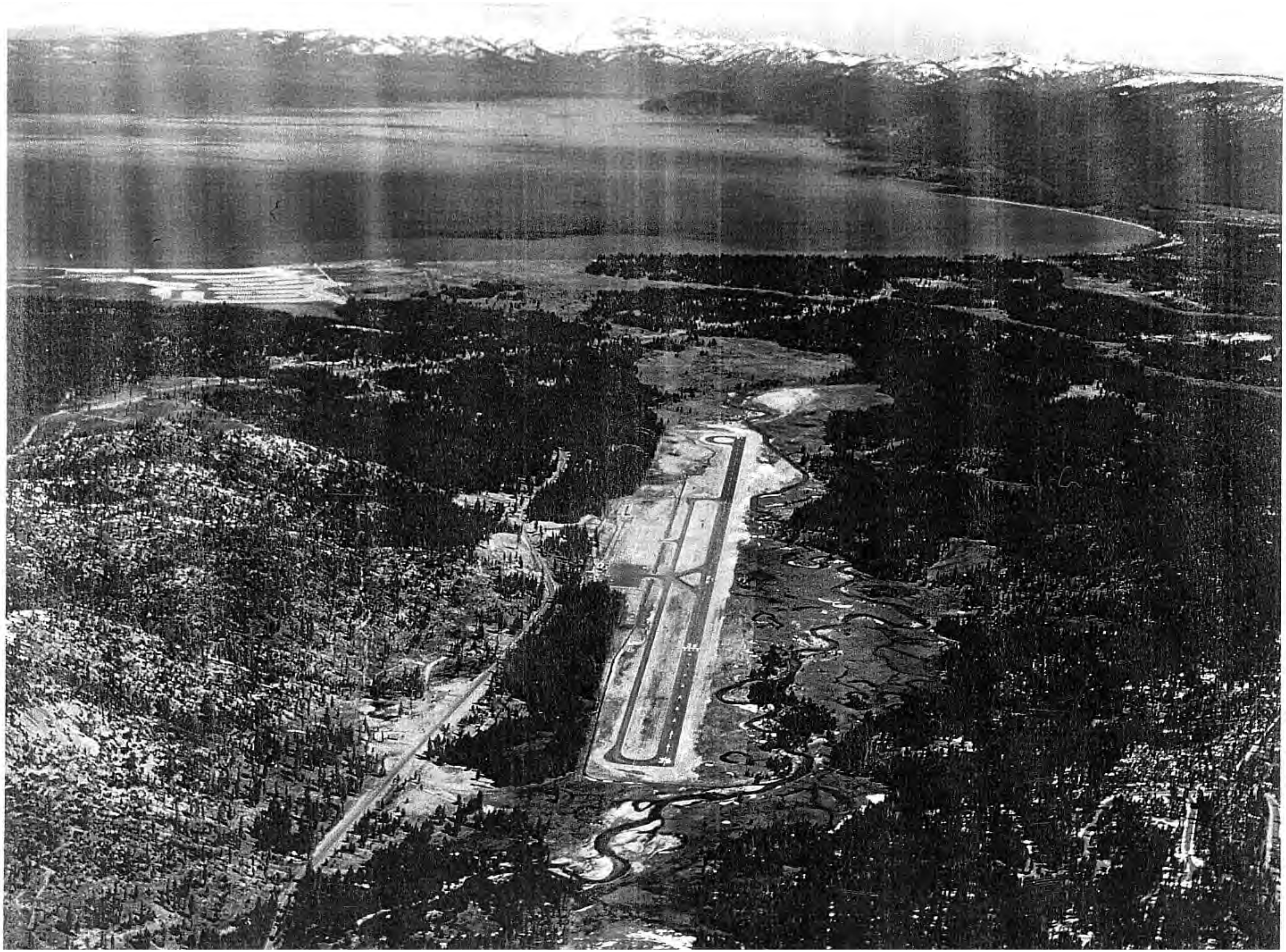
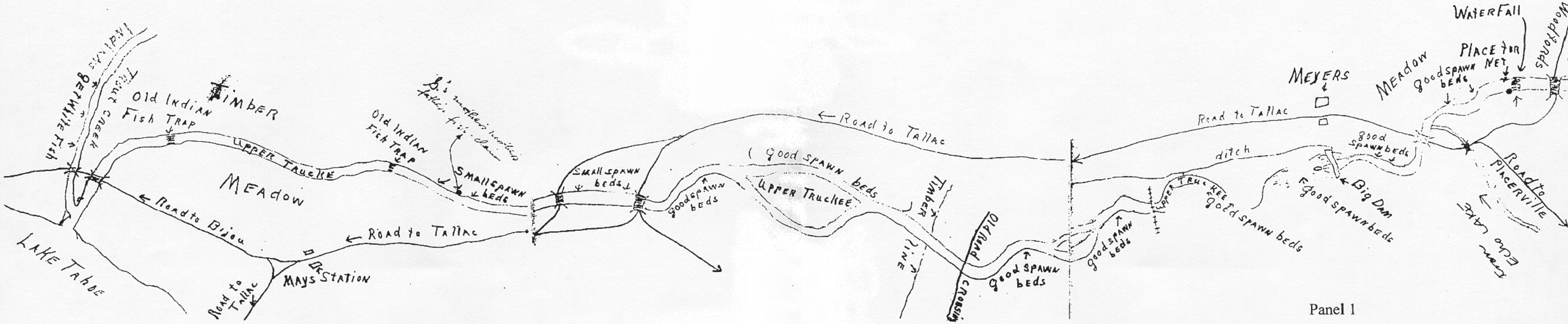


Plate III.J.4. Upper Truckee River and flood plain showing Lke Tahoe Airport runway expansion construction; view north-northeast, ca. 1963 (photo credit: Lake Tahoe Historical Society Mack Wardell Collection)

Plate III.J.5. Uppper Truckee River and floodplain showing Lake Tahoe Airport Keys under construction; view north-northeast. ca. post 1963 (photo credit: Lake Tahoe Historical Society Mack Wardell Collection)





Panel 1

Panel 2

Panel 3

Figure III.J.1: Three panels of a map sketched by George Snooks in 1937 of fishing spots on the Upper Truckee River (Siskin 90-03)

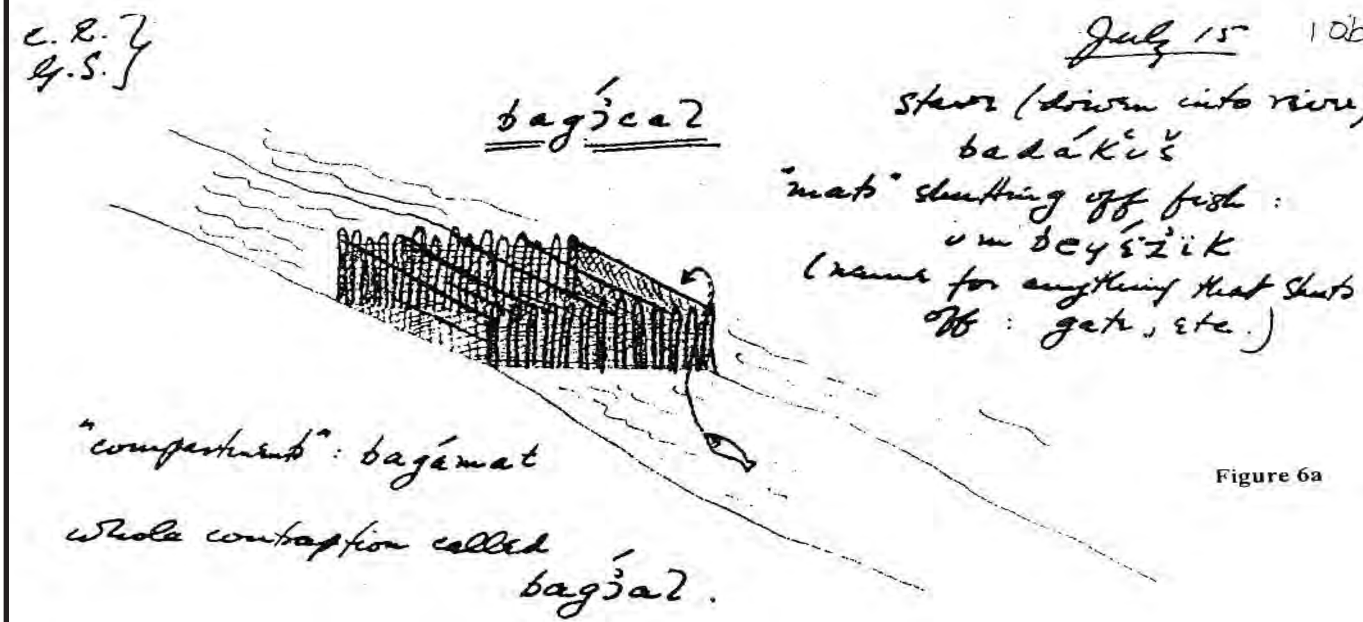


Figure 6a

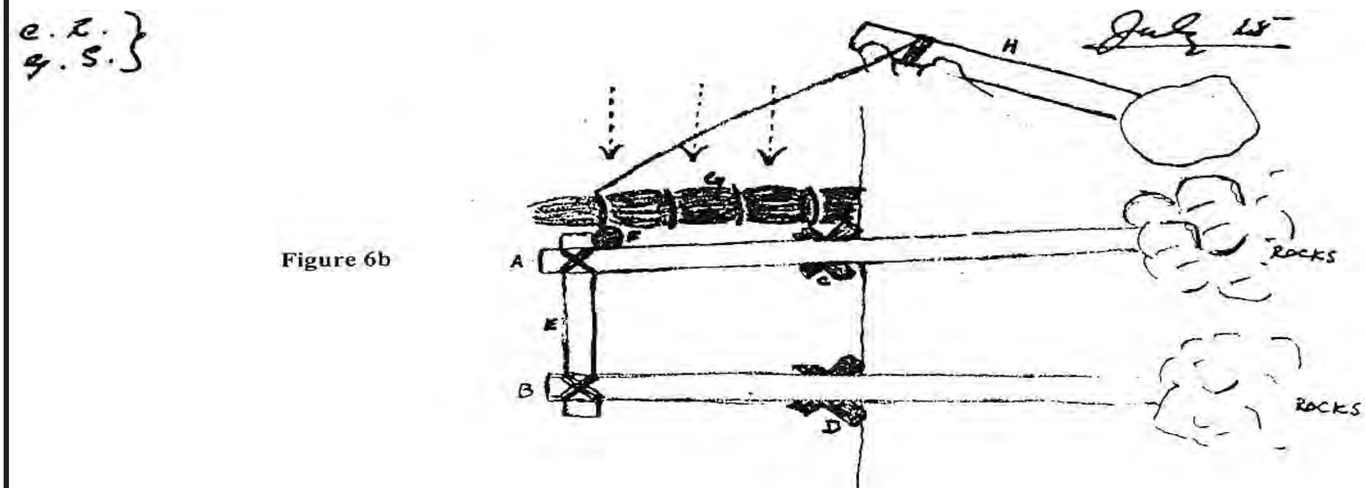


Figure 6b

Figure III.J.2a &b. Sketches of fiching facilities by Edgar Siskin (90-03)

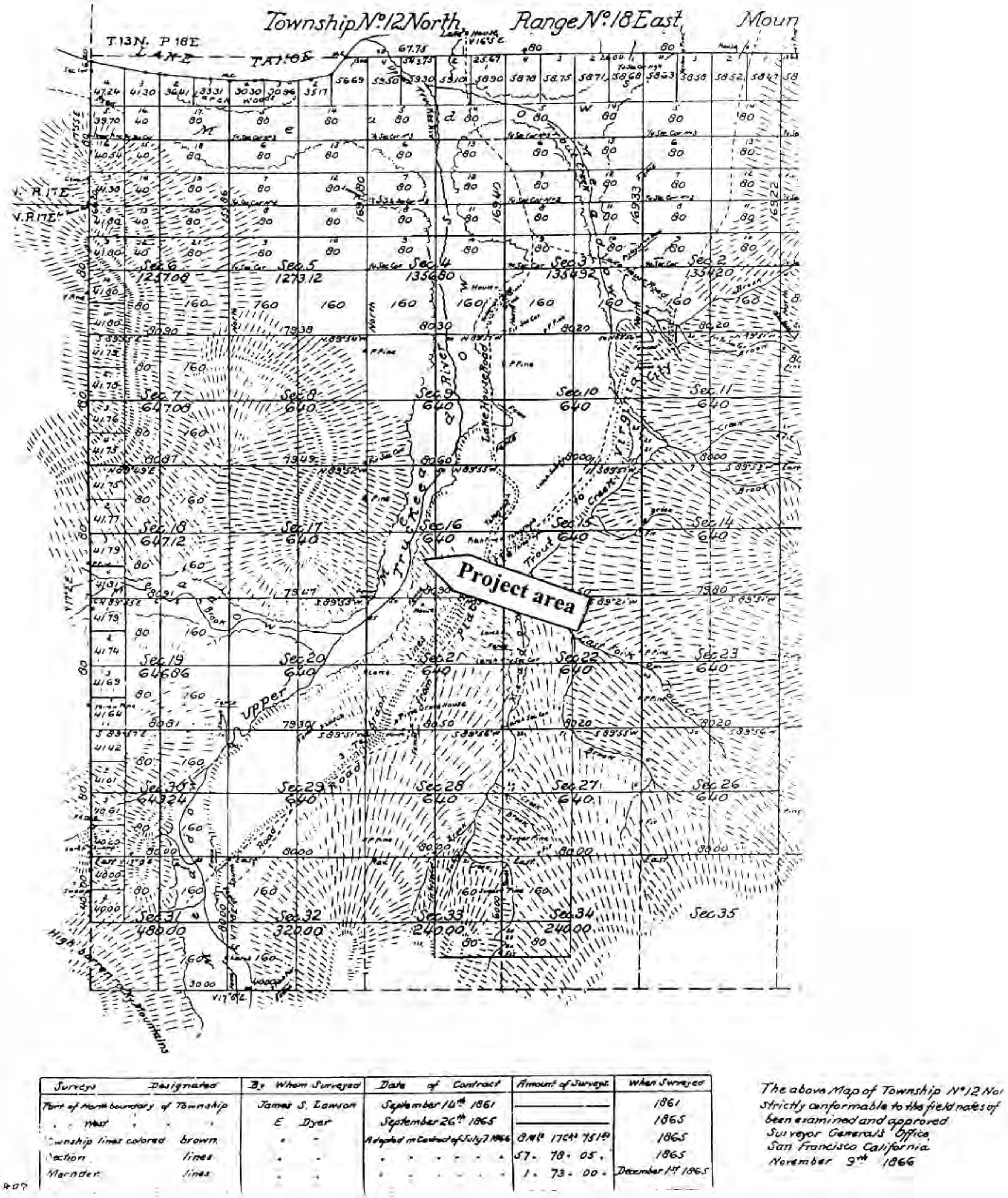


Figure III.J.3. General Land Office (GLO) survey plot, 1861/1865

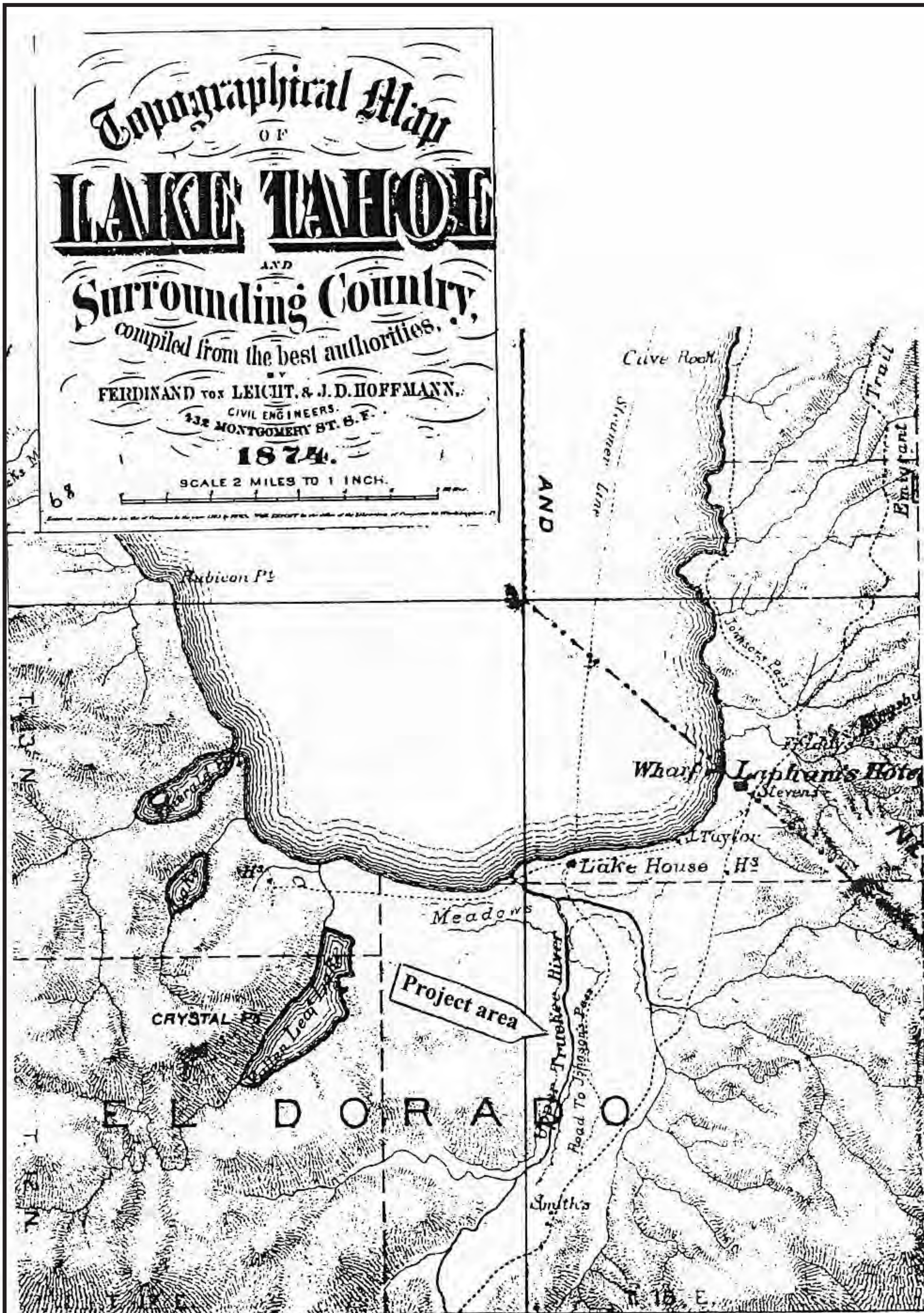


Figure III.J.4. Topographic map of Lake Tahoe, 1874

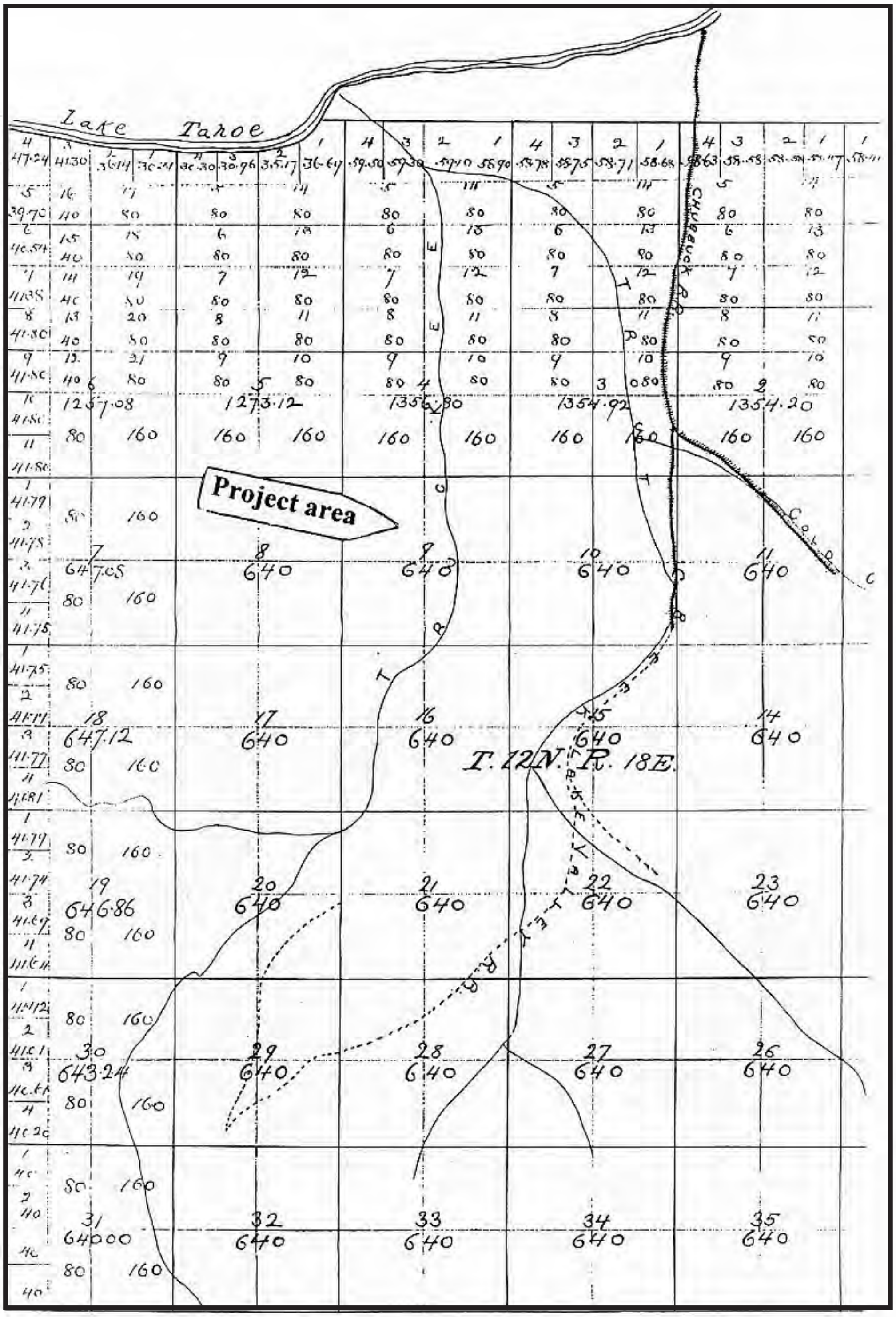


Figure III.J.5. Map showing location of the Lake Valley Railroad, December 15, 1887

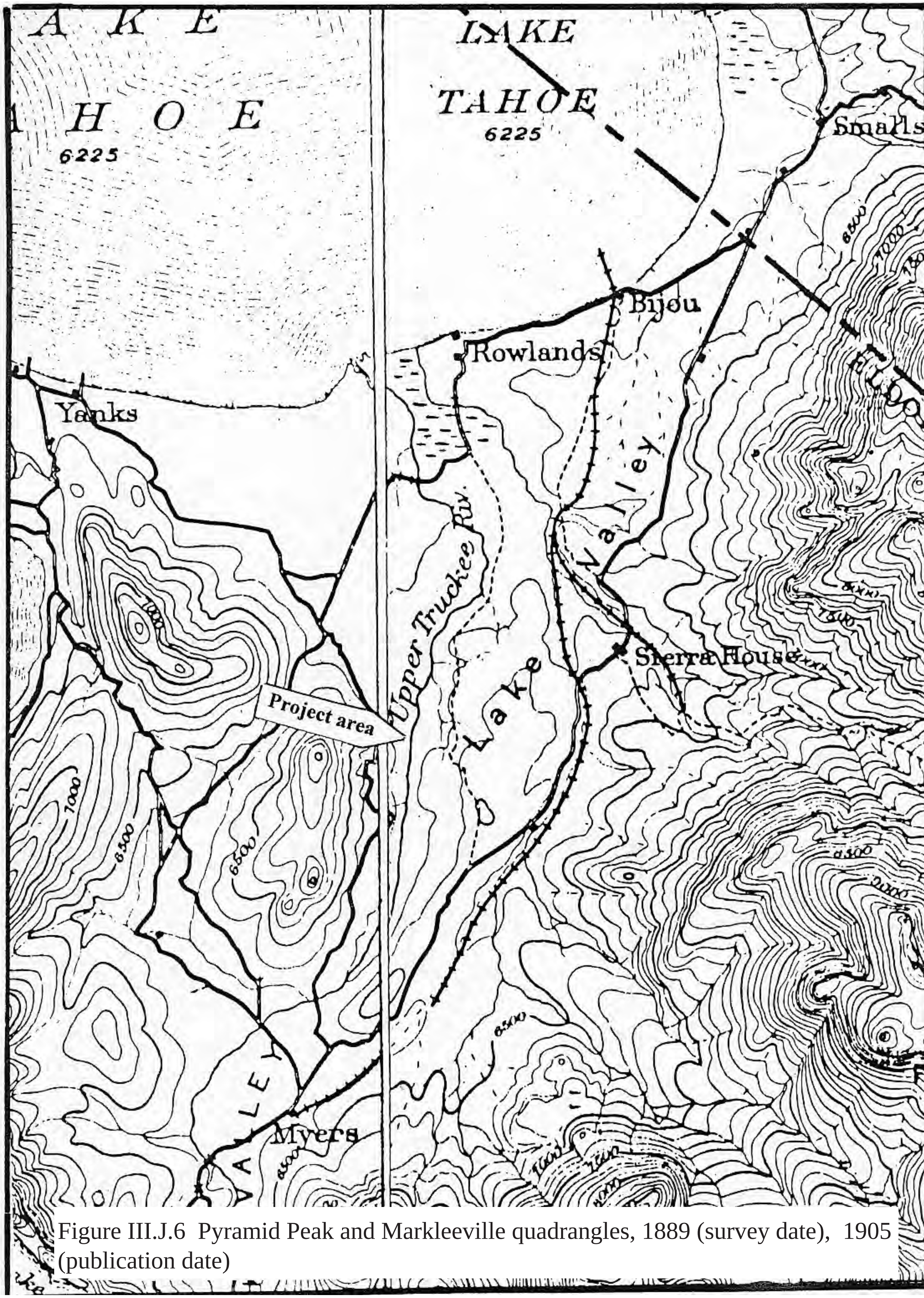


Figure III.J.6 Pyramid Peak and Markleeville quadrangles, 1889 (survey date), 1905 (publication date)

Figure III.J.7 Map of El Dorado County compiled from the Office of Records and Surveys and Punnet Bros. For Shelly Inch. 1895

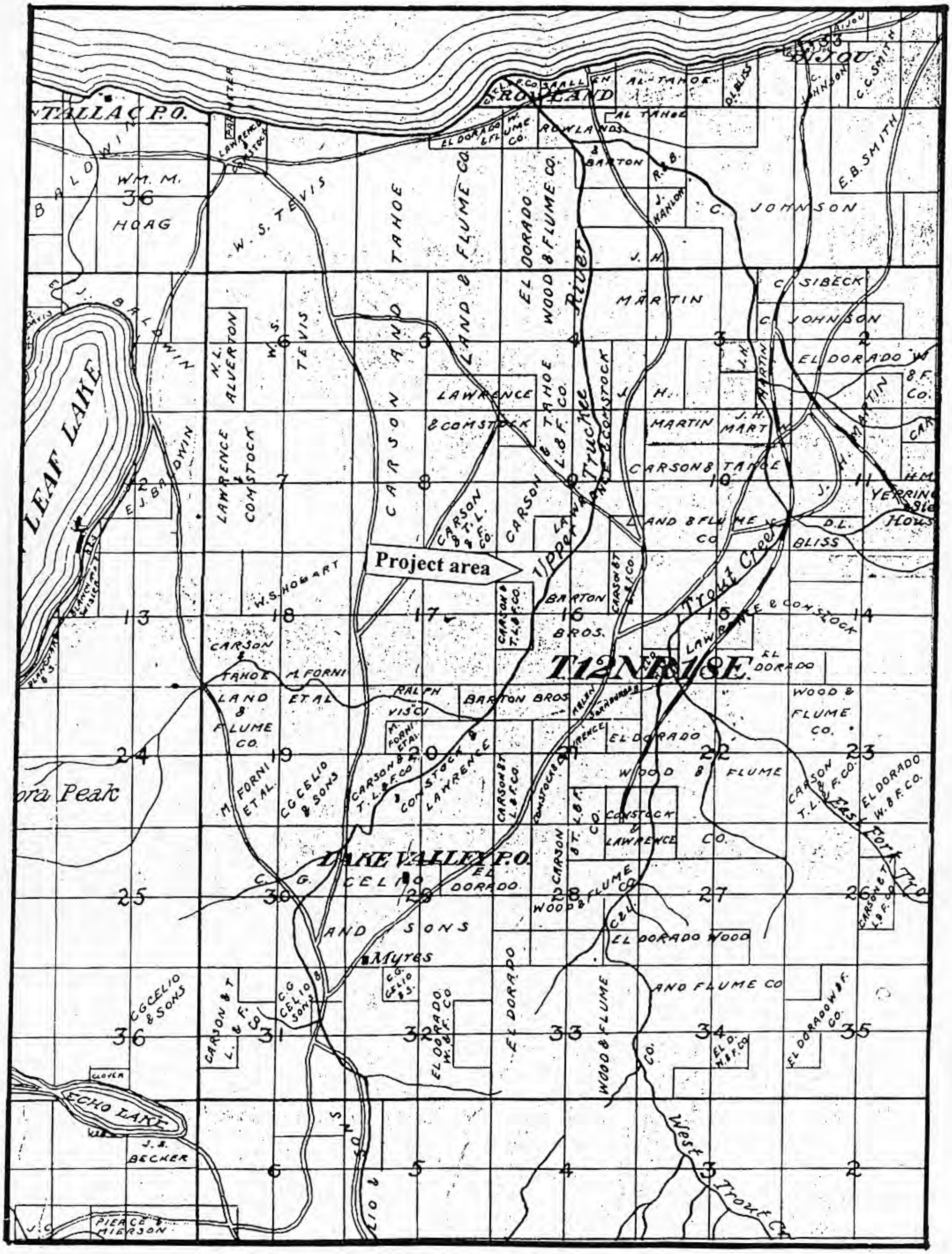


Figure III.J.8. Map of El Dorado County compiled from official records and surveys by Pierce Bosquit Abstract and Title Company and Guy E. Pierce, County Surveyor, 1908

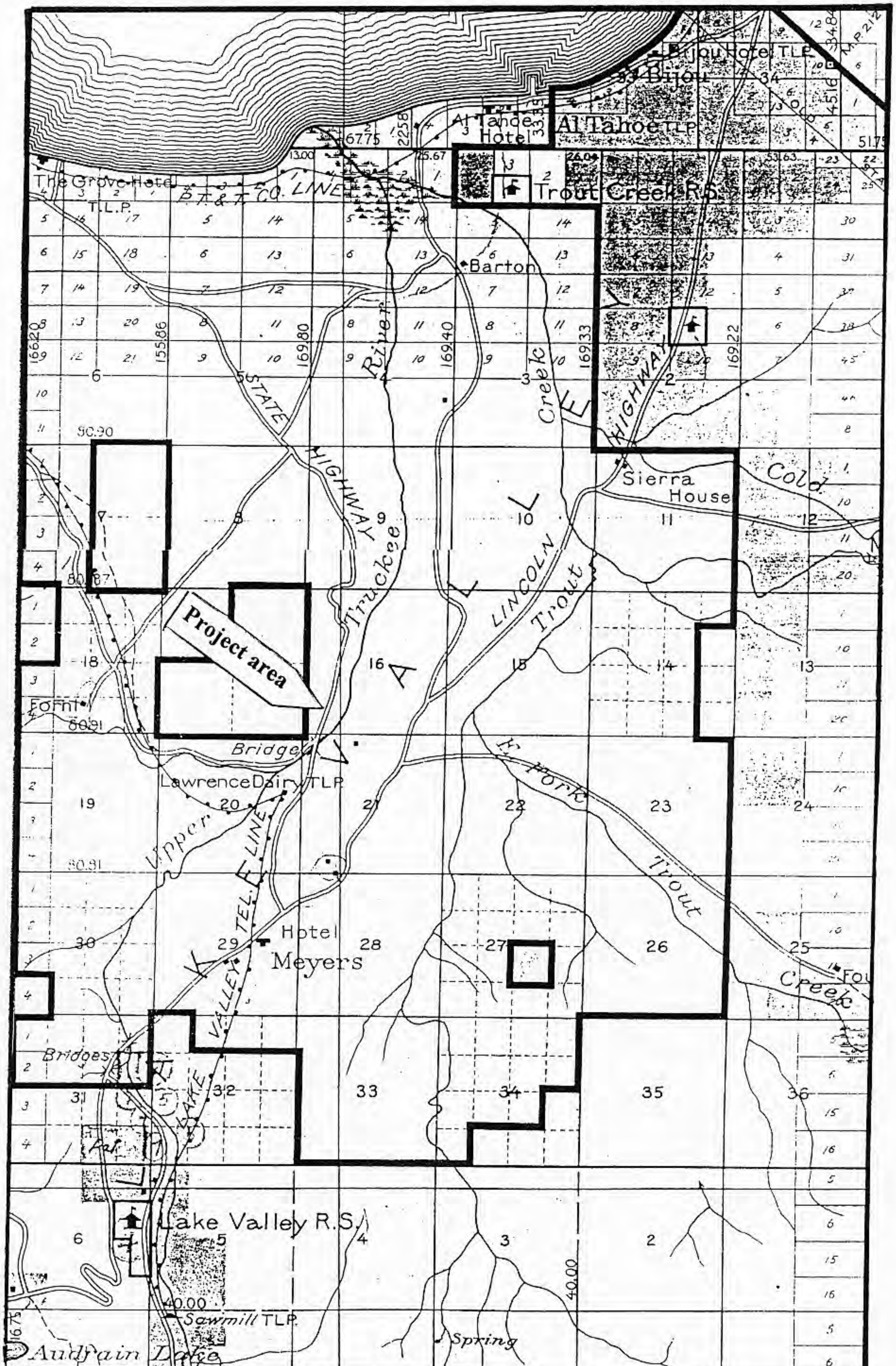


Figure III.J.9a. "Eldorado" compiled from GLO plats and Forest Supervisors's data, April 1914

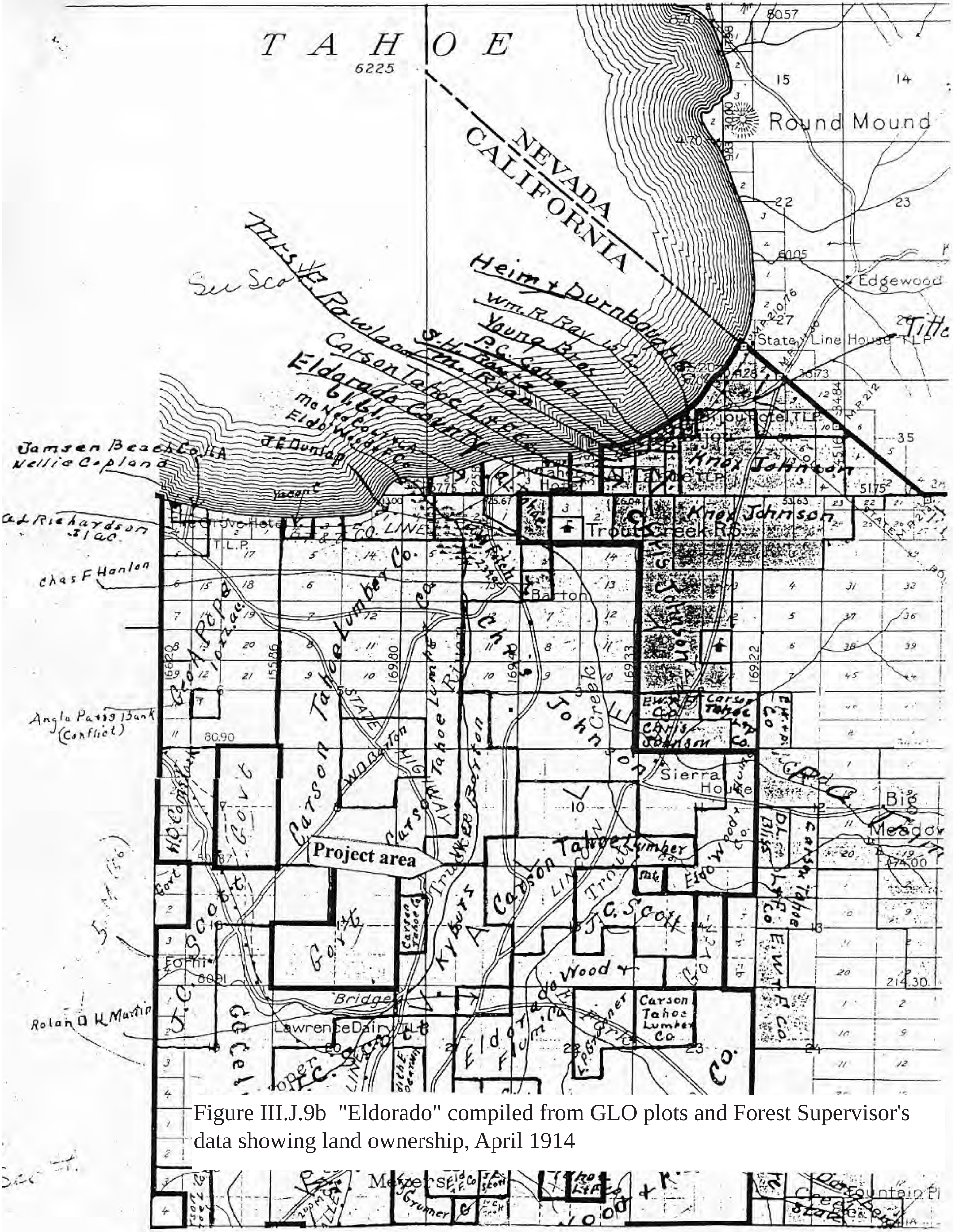


Figure III.J.9b "Eldorado" compiled from GLO plots and Forest Supervisor's data showing land ownership, April 1914

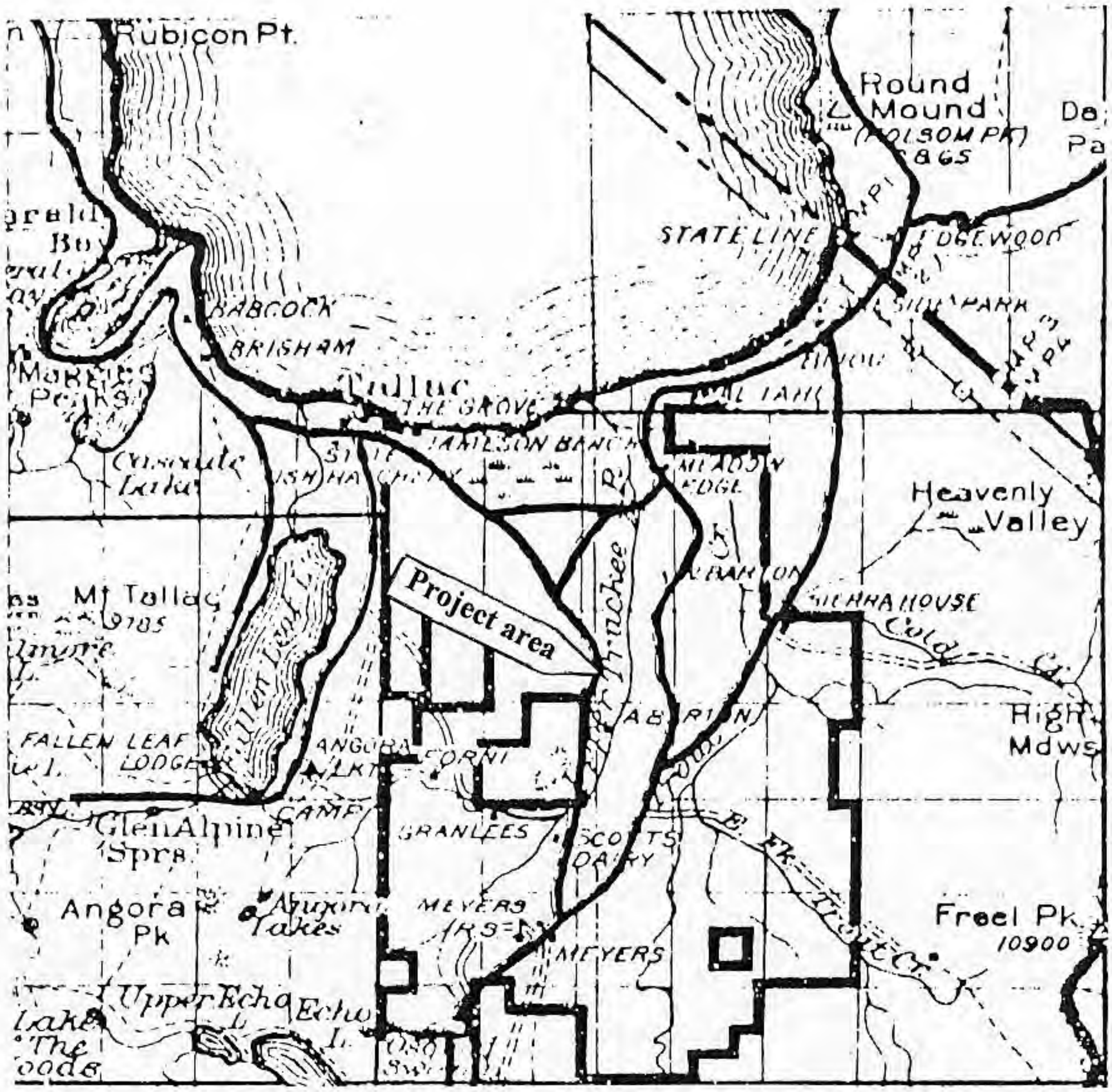


Figure III.J.10 Map of Eldorado National Forest, 1926

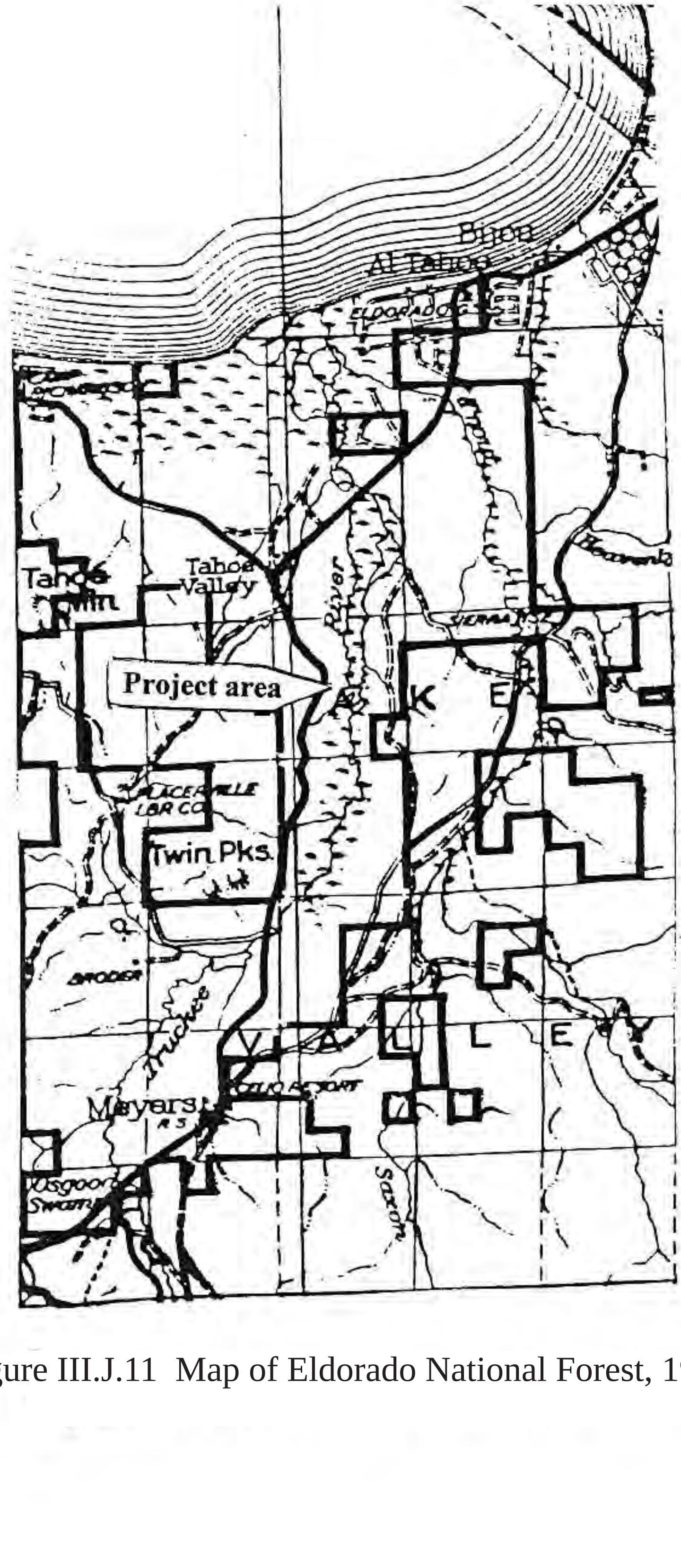


Figure III.J.11 Map of Eldorado National Forest, 1949

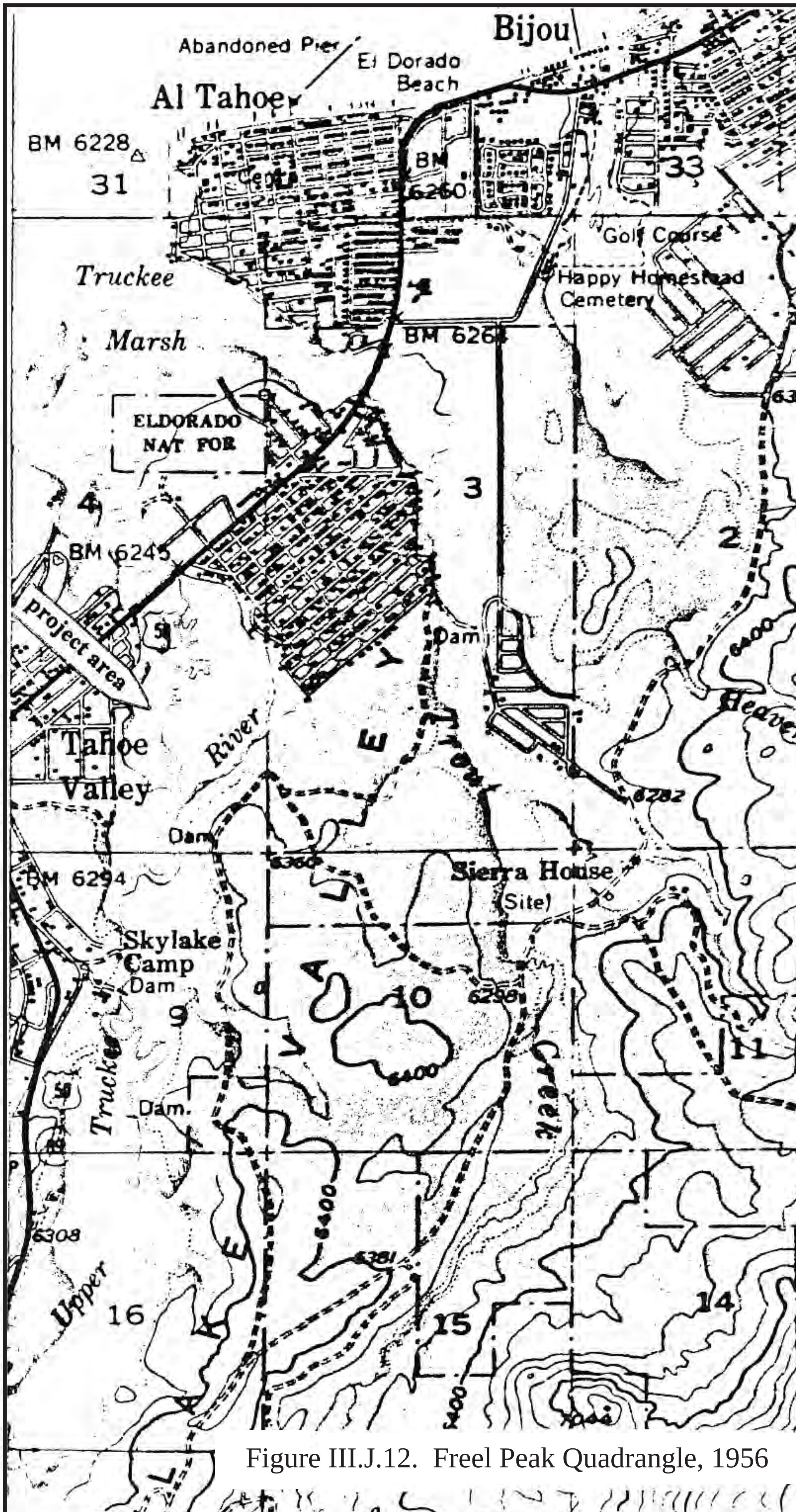


Figure III.J.12. Freel Peak Quadrangle, 1956

Figure III.J.13. Map of Lake Tahoe South Shore by Howard J. Fisher (Inter County Title Company, Bijou), 1959

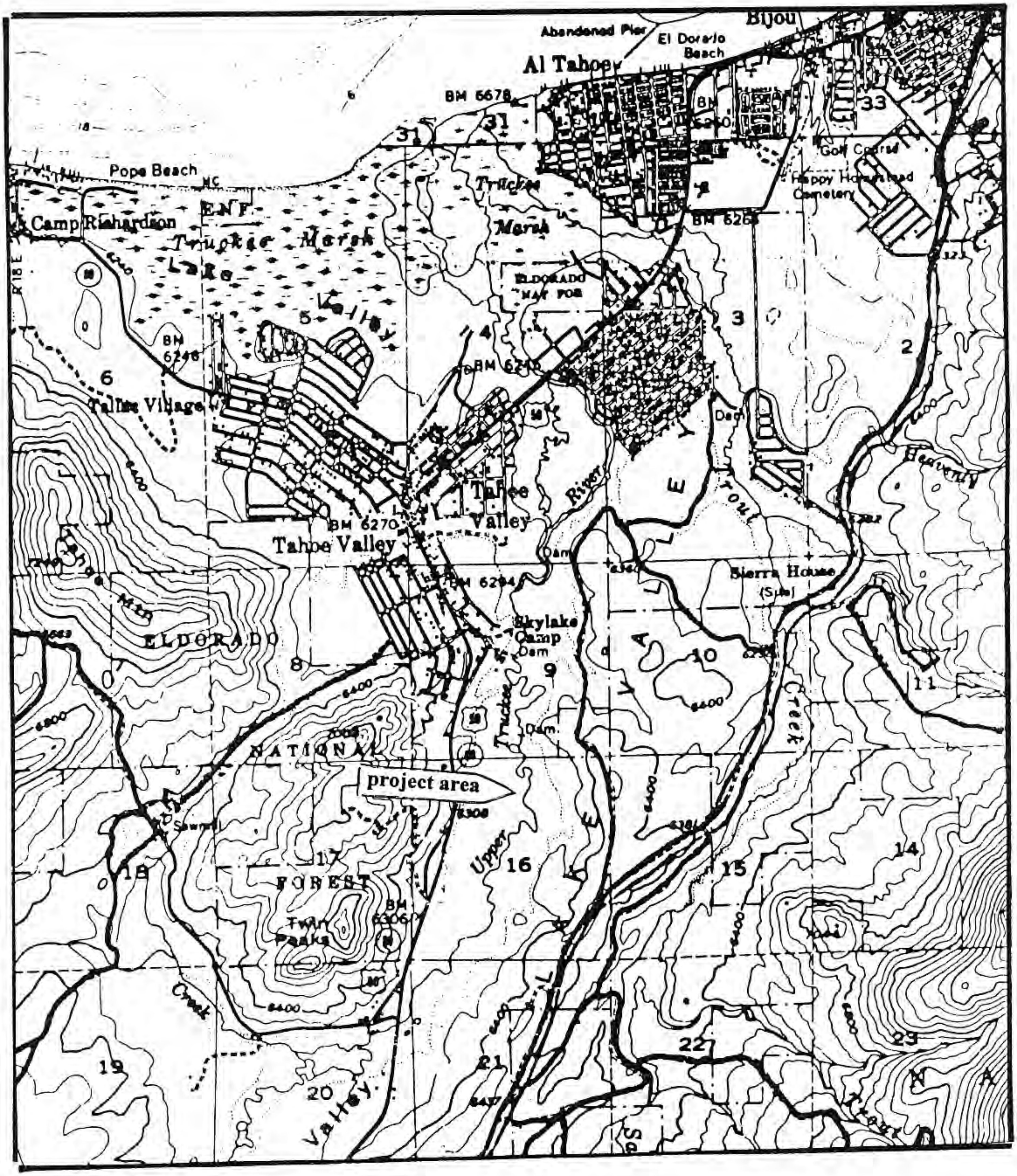
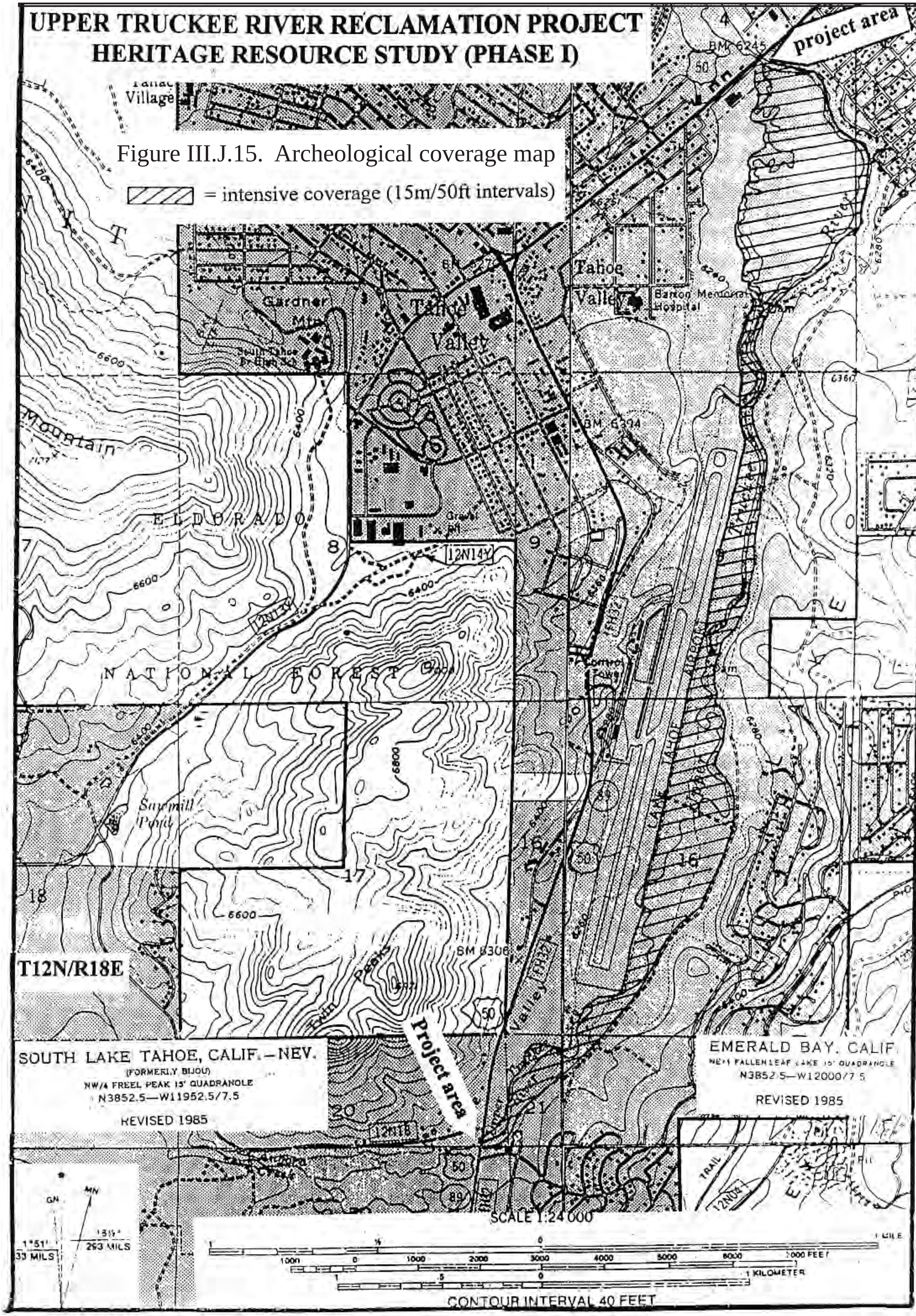


Figure III.J.14. Lake Tahoe Basin (compiled from USGS Quad), 1961



UPPER TRUCKEE RIVER RECLAMATION PROJECT
HERITAGE RESOURCE STUDY (PHASE I)
Figure III.J.15. Archeological coverage map
= intensive coverage (15m/50ft intervals)
project area
Project area
T12N/R18E
Tahoe Valley
Barton Memorial Hospital
Gardner Mtn
ELDORADO
NATIONAL FOREST
Sawmill Pond
12N14Y
SOUTH LAKE TAHOE, CALIF.—NEV.
(FORMERLY BIJOU)
NW/4 FREEL PEAK 15' QUADRANGLE
N3852.5—W11952.5/7.5
REVISED 1985
EMERALD BAY, CALIF.
N3852.5—W12000/7.5
REVISED 1985
SCALE 1:24 000
CONTOUR INTERVAL 40 FEET

III.J.6 **References/Work Cited**

Barrett, S. 1916 *The Washo Indians. Bulletin of the Public Museum of the City of Milwaukee* Vol.2 NO.1:1-52

Brown, Jody L. 1991 First Addendum Archaeological Survey Report for the Three Bridges within the Lake Tahoe Basin on State route 50. Report on file NCIC-CSUS. Sacramento.

Cohodas, M. 1979 *Degikup: Washoe Fancy Basketry 1895 - 1935*. The Fine Arts Gallery of the University of British Columbia. Vancouver.

Cordone, A. and T.C. Frantz 1966 The Lake Tahoe Sport Fishery. *California Fish and Game* 52(4):240-274. d'Azevedo, W.

1956 Washo Place Names. Unpublished manuscript in possession of author. Reno, Nevada.

1986 The Washoe. In *The Great Basin*, edited by Warren L. d'Azevedo, pp.466-499. Handbook of North American Indians, vol.11, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

99-14 Washoe Indian Research Papers of Warren L. d'Azevedo. Special Collections Department University Library. University of Nevada-Reno.

Downs, J. 1966 *The Two Worlds of the Washo: an Indian Tribe of California and Nevada*. Holt Rinehart and Winston, Inc. Fort Worth.

Drews, Michael 2000 Mos*her Timber Harvest Plan*. Report on file NCIC-CSUS. Sacramento.

Elliott-Fisk, Dd. Et al. 1996 Sierra Nevada Ecosystems Project. Sierra Nevada Ecosystem Project Final Report to Congress. *Wildland Resources Center Report* No. 40. Davis. University of California. Pp. 217-268.

Elston, R. 1982 Western Great Basin Prehistory. In: Man and Environment in the Great Basin, David B. Madsen and James F. O'Connell, eds., pp. 186-206. Society for American Archaeology Paper No. 2. Washington D.C.

1986 Prehistory of the Western Area. In: Handbook of North American Indians, Vol. 11, Great Basin, W. L. Elston, d'Azevedo, ed., pp. 135-148. Washington: Smithsonian Institution.

Elston, R., J. O. Davis, A. Leventhal, and C. Covington l977 The Archaeology of the

Tahoe Reach of the Truckee River. Ms on file Getchell Library, University of Nevada, Reno.

Elston, Robert, Susan Stornetta, Daniel Dugas, and Peter Mires 1994 Beyond the Blue Roof: Archaeological Survey on Mt. Rose Fan and Northern Steamboat Hills. Intermountain Research. Silver City. Reported submitted to the Toiyabe National Forest.

Forney, S.J. 1995 Both Artifact and Habitat. *Federal Archaeology* 8(1):19-21. Washington, DC: National Park Service.

Freed, S. 1966 Washo Habitation Sites in the Lake Tahoe Area. In Notes on Western Nevada Archaeology and Ethnography. *University of California Archaeological Survey Reports* 66(3):73-84. Berkeley.

Galloway, J. D. l947 Early Engineering Works Contributory to the Comstock. Nevada Bureau of Mines and Geology, Geology and Mining Series, No. 45. Reno.

Goldman, C.R. and E. Byron 1986 *Changing Water Quality at Lake Tahoe*. University of California Institute of Ecology, Tahoe Research Group. Davis.

Heizer, R. and A. B. Elsasser l953 Some Archaeological Sites and Cultures of the Central Sierra Nevada. University of California Archaeological Survey Report 2l:l-42. Berkeley.

Heyvaert, A. 1998 The Biogeochemistry and Paleolimnology of Sediments from lake Tahoe, California-Nevada. PhD dissertation. University of California, Davis.

Hoover, M. B., H. E. Rensch and E. G. Rensch 1966 <u>Historic Spots in California</u>. Stanford: Stanford University Press.

Inter-Tribal Council of Nevada (ITCN) 1976 ITCN History Project. Tapes and manuscripts on file, Nevada Historical Society, Reno, Nevada.

Jacobsen, W. H., Jr. 1996 *Beginning Washo.* Occasional Papers No.5 Nevada State Museum. Carson City, Nevada.

Juday, C. 1906 Notes on Lake Tahoe, its Trout and Trout Fishing. Bulletin, US Bureau of Fisheries 26:137-146.

Knowles, C. l942 A History of Lumbering in the Truckee Basin from l856 to l936. Works Progress Administration, Project Number 95l2375. Ms on file Nevada Historical Society. Reno.

Laine, Del 2002 Personal communication August 2002 (long-term resident of Upper

Truckee River area and former mayor of City of South Lake Tahoe). South Lake Tahoe.

Landauer, Lyn 2002 Personal communication August 2002 (long-term resident of South Lake Tahoe; former president of Lake Tahoe Historical Society; historian and author). South Lake Tahoe.

Ledbetter, Bill 1994 Personal communication in 1994 (Barton family member). South Lake Tahoe.

Lake Tahoe Area Council (LTAC) 1963 Comprehensive Study on Protection of Water Resources of Lake Tahoe Basin through Controlled Waste Disposal. Prepared for LTAC by Engineering-Science, Ind., Tahoe City.

Lanner, R. 1981 *The Piñon Pine: A Natural and Cultural History*. Universityof Nevada Press. Reno

Leiberg, John B. 1902 Forest Conditions in the Northern Sierra Nevada, California. *US Geological survey Professional Paper No*. 8, Series H, Forestry, 5. Government Printing Office: Washington DC.

Lindström, S.G. l978 An Archaeological Reconnaissance of the Pacific Crest Trail, Tahoe National Forest. Ms on file Tahoe National Forest, Nevada City.

l982 Archaeological Test Excavations at Oiyer Springs and Pi Pi Valley. Ms on file Eldorado National Forest, Placerville.

1990 Submerged Tree Stumps as Indicators of Mid-Holocene Aridity in the Lake Tahoe Basin *Journal of California and Great Basin Anthropology* 1992).

1992 *Great Basin Fisherfolk: Optimal Diet Breadth Modeling the Truckee River Aboriginal Subsistence Fishery*. Unpublished PhD dissertation, Department of Anthropology, University of California Davis.

1994 *Heritage Resource Inventory South Tahoe Public Utilities District A-Line Export Pipeline Relocation Project, 6.5-Mile Pipeline in South Lake Tahoe*. Report on file NCIC-CSUS. Sacramento.

1995 *Heritage Resource Study of Valley View Planned Development, El Dorado County*. Report on file NCIC-CSUS.

1996 Great Basin Fisherfolk. In *Prehistoric Hunter-Gatherer Fishing Strategies*, edited by M. Plew. Boise State University Press.

1997 *Heritage Resource Study of the Upper Truckee River Stream Restoration Project*

(Cove East). Report on file NCIC-CSUS.

Lindström, S. G. and W. Bloomer 1994 Evaluation of Site Data Potential for 26Wa5322 (TY3437/05-19-280), Tahoe Meadows Prehistoric Site Complex, Segment 17 of the Tahoe Rim Trail near Mt. Rose, Lake Tahoe, Nevada, Washoe County. Report TY-94-1004 on file Toiyabe National Forest. Sparks.

Lindström, S.G., W. Bloomer, P. Rucks, and D.Craig Young, Jr. 2002 Lake Tahoe Environmental Improvement Program Restoration and Rehabilitation of Truckee River Outlet Parcel, Tahoe City. Report on file State of California, Department of Parks and Recreation. Ssacramento.

Lindström, S.G. and J. Hall 1998 *Heritage Resources Inventory for the Pioneer Timber Sale*. Report on file USFS-LTBMU. South Lake Tahoe.

Lindstrom and Waechter 1995 *North Shore Ecosystems Project Heritage Resources Inventory – Nevada Area*. Report on file USFS-LTBMU. South Lake Tahoe.

1996 *North Shore Ecosystems Project Heritage Resources Inventory – California Area*. Report on file USFS-LTBMU. South Lake Tahoe.

Lindström, S., P. Rucks, and P. Wigand 2000 Chapter 2: A Contextual Overview of Human Land use and Environmental Conditions. In *The Lake Tahoe Watershed Assessment* Vol. 1. USDA Forest Service, Lake Tahoe Basin Management Unit. South Lake Tahoe, California.

Lord, Eliot l883 Comstock Mining and Miners. U.S. Geological Survey l5.

Lowie, R. 1939 *Ethnographic Notes on the Washo. University of California Publications in American Archaeology and Ethnology*. Vol.5 No.7.

Maniery, Mary 1989 Negative Historic Properties Survey Report of Three Bridges within the Lake Tahoe Basin on State Route 50. Ms. on file North Central Information Center, California State University, Sacramento.

McKelvey, K.S. and J.D. Johnston 1992 Historical Perspectives on Forests of the Sierra Nevada and Transverse Ranges of Southern California: Forest Conditions at the Turn of the Century. In *The California Spotted Owl: A Technical Assessment of its Current Status*, edited by Jared Verner et al., 2250246. General Technical Report PSW-GTR-133. San Francisco: USDA Forest Service Pacific Southwest Region.

Mitchell, Betty 2002 Personal communication August 2002 (long-term resident of South Lake Tahoe; president of Lake Tahoe Historical Society). South Lake Tahoe.

Moore, M. and T. Burke 1992 Cultural Resource Inventory and Evaluation: Truckee River

Flood Control Project, Washoe and Storey Counties. Nevada. Summary Report. Archaeological Research Services. Virginia City. Report submitted to the Army Corps of Engineers. Sacramento.

Mosher, Bill, Sr.2002 Personal communication September 2002 (owner of portions of project area; Barton family in-law). Elks Grove, California.

Mosher, Melba 2002 Personal communication September 2002 (owner of portions of project area; Barton family member). Elks Grove, California.

Myrick, D. l962 Railroads of Nevada and Eastern California. Howell North. San Diego.

National Science Foundation 92-09 Field Notes. University of Nevada Ethnographic Archive. In the National Science Foundation Graduate Field Training Project in Anthropology Collection, Special Collection Department University of Nevada-Reno.

Nevers, J. 1976 *Wa She Shu*. Inter-tribal Council of Nevada.

O'Brien, Sheryl 1993 *Heavenly 8 & 9 Forest Health Fuelwood Sale* (CRR #05-19-170-B). Report on file USFS-LTBMU. South Lake Tahoe.

Oliver, Tim 2002 Personal communication (TRCD). South Lake Tahoe.

Owens, Jerry 2002 Personal communication (NRCS). South Lake Tahoe.

Orr, R.T. and J. Moffitt 1971 Birds of the Lake Tahoe Region. California Academy of Sciences. San Francisco.

Peters, M.P. and M.A. Peak 1984 *Cultural Resource Assessment of the South Lake Tahoe Airport Expansion Project*. Report on file NCIC-CSUS. Sacramento.

Placerville Herald 1853 4/1853. Placerville

Price, J. 1980 *The Washo Indians: History, Life Cycle, Religion, Technology, Economy, and Modern Life*. Nevada State Museum Occasional Papers 4.

Rucks, M. M. 1995 The Social Context and Cultural Meaning of Ground Stone Milling Among Washoe Women. Unpublished Master's thesis, Department of Anthropology, University of Nevada-Reno.

1996 *Ethnographic Report for North Shore Ecosystems Heritage Resource Report* (HRR #05-19-297). Report on file USFS-LTBMU. South Lake Tahoe.

1999 Transcriptions from the Washoe Ethnographers Project: Twelve Interviews. On file, University of Neveda-Reno Oral History Program.

Sacramento Daily Union 1857 7/17/1857. Sacramento.

Salley, H. E. 1977 History of California Post Offices, 1849-1976. La Mesa, California: Heartland Printing and Publishing Co.

San Francisco Chronicle 1995 8/21/1995. San Francisco.

Scott, E.B. 1957 *The Saga of Lake Tahoe* Vol. 1 Sierra-Tahoe Publishing Company. Crystal Bay, Nevada.

Shamberger, H.A. 1969 *Water Supply for the Comstock*. Geological survey Professional Paper 779. Carson City: Nevada Historical Press.

Sioli, Paolo 1883 *Historical Souvenir of El Dorado County California*. Paolo Sioli Publisher. Oakland.

Siskin, E. 90-03 The Field Notes of Edgar E. Siskin. Special Collections Department (90-03). University Library University of Nevada, Reno.

Sudworth, G.B. 1900 Stanislaus and Lake Tahoe Forest Reserves, California, and Adjacent Territory. 21st *Annual Report*. USGS, Part V. Forest Preserves.

Tahoe Tattler 1938 Volume 4, Number 2, 7/8/1938. Tahoe City.

Taylor, A. 1997 *Reconstruction of Pre-Euroamerican Forest Structure, Composition, and Fire History in the Carson Range, LTBMU*. Report on file USFS-LTBMU. South Lake Tahoe.

Taylor, Chuck 2002 Personal communication (NRCS). South Lake Tahoe.

Townley, J.M. 1980 *The Truckee Basin Fishery, 1844-1944*. Nevada Historical Society Publication 43008. Reno.

UNOHP 1992- 1994 Unedited transcripts from the Washoe Indian Project. University of Nevada-Reno Oral History Program. University of Nevada, Reno.

1965- 1996 Indexes to Collections. University of Nevada-Reno Oral History Program. University of Nevada, Reno.

Van Etten, C. 1987 Tahoe City Yesterdays. Sierra Maritime Publications. Tahoe City.

Weeks, David 1934 The Utilization of El Dorado County Land. University of California College of Agriculture, Agriculture Experiment Station. Bulletin 572. University of

California, Berkeley.

Vernon, W. 1980 Oral History. UNHOP. University of Nevada-Reno.

Washoe Tribal Council 1994

Wigand, P. and D. Rhode 2000 Great Basin Vegetation History and Aquatic Systems: The Last 150,000 years. *Smithsonian Contribution to Earth Sciences.*

Wier, J. MSS86/1720 The Papers of Jean Elizabeth Wier. Nevada Historical Society. Reno, Nevada

Wright, G. 90-37 The Papers pf George F. Wright. Special Collections Department (90-37). University Library. University of Nevada, Reno.

III.J.7 APPENDIX: Stephan James (Washoe Biography)

Mr. James spent summers with his mother Mabel James, at the south shore of Lake Tahoe. He lived with other family members in a cabin they considered theirs in the Camp Richardson area until new owners of the resort, part of the post-WWII development trend, tore it down. Mrs. James had done laundry for the Hellers of the Valhalla Estate and had moved her family into the cabin every spring. Either in 1945 or 1946, she arrived to find the cabin demolished and her possessions gone. In protest, she never returned to Tahoe. Steve James, however, continued to find work at Tahoe in the summers throughout his high school years until he was drafted during the Korean War in 1953. He found it increasingly difficult to find places at the Lake he could camp; each year more and more places stated, “keep out” and he recalled that several of his friends would carpool daily to jobs at the lake from Dresslerville.

Mr. James’ history has deep ties to the south shore of Lake Tahoe. His mother and father, Mabel and Roma James camped at *dewgélki_*, where his brother, Ivan, was born. Mabel used the milling station there to grind sunflowers and pine nuts. His paternal grandparents were Ben James, a prominent hunting and fishing guide and respected tribal spokesman; and Maggie Mayo James, a premier basket maker whose masterworks endure, still considered to be among the finest in the world (Cohodas 1975). Ben James had worked for a logging outfit (possibly Gardner’s) at south shore before running a stable and operating as a fishing and game guide. Mr. James’ maternal grandmother, Clara Richards Frank, was one of a handful of consultants who consistently worked with anthropologists documenting Washoe culture, working with at least two generations of anthropologists (1937-1965).

Steve James was born in Douglas County in the Dresslerville area, March 9, 1933 and spent every summer at Lake Tahoe “as far back” as he could remember. Before starting school at Stewart, he spent the winters in Dresslerville with his family after leaving their family place in the Pine Nut Hills just before the first snowfall.

Mr. James remembers that his mother, Mabel, walked to the building where she did the Heller laundry, in a building located between Valhalla and the highway. She had to pump water, heat it on a wood stove, and do laundry in tubs with a washboard. She also did the ironing. He also recalled that Mrs. Heller sent the limousine to his family's cabin at the Camp Richardson campground to take him to play with the Heller daughters, "enjoying picnics and speed boat rides; seeing the sights" and having a wonderful time.

The family cabin is described as adjacent to the Washoe cemetery currently enclosed by a fence. But at the time, Mr. James says this area was not protected and that many burials, marked by two rocks, one at the head and the other at the foot of the grave, were obliterated by horses trailing through the area during trail rides operated by a riding stable located between the highway and his family's cabin; (not the same establishment or location of the current Richardson Stables).

His father, Roma, had a trade as an electrician and began "working all over" so Steve recalls he was not around a lot in the summers. Family tradition relates that Roma got intrigued during an incredible winter that he and Mabel were snow bound, living in the Pope Boathouse. With nothing to do, Roma started fooling around with the stored boat batteries and decided he wanted to pursue working as an electrician. Steve thinks he was self taught but got plenty of work around.

Roma had been through WWI and continued working as a caretaker for the Hellers through WII; Mabel continued to do laundry. Roma also helped out with his father's, Ben James', riding stable, as did all the uncles (Roy, Don, and Earl). His younger uncles, older brother, and many of their friends were in WWII.

In 1945, or 1946, the summers at the Camp Richardson cabin came "to a screeching halt", when, without warning, their cabin was demolished by new owners who also disposed of their possessions. Mr. James thinks the family stayed with his maternal grandmother, Clara Frank.

Mr. James continued to find work in the summers, mostly camping out; He got odd jobs, mostly clean up work, yard work, and wood cutting, sometimes for the Celio Mill. He said maybe 4 or 5 men would get together and camp where they could; the women mostly worked at the resorts through work agreements with the Stewart Indian School, and had places to stay. Eventually it was too hard to find places to camp and in later years, several people would carpool to the lake from Dresslerville. Summer jobs were hard to come by, and people were just glad for the work. At least one summer, he lived at his Uncle Roy's wood cutting camp off Daggett Pass in the Kingbury Grade area; he didn't work for his Uncle; he found his own jobs, working "around" but stayed at his camp. Other times, he stayed with his Uncle Don and rode into the high country a few times with his other cousins and Uncles, to stock lakes with fingerling trout packed in five gallon cans. He remembers going pine nutting in the Pine Nut Hills right after these summers.

Mr. James recalls very clearly, the tradition of families claiming specific fishing holes and recalls during his teen years, fishing “up and down” the Upper Truckee” with his cousins; not every year, just once in awhile. They used grappling hooks during the spring runs, an illegal practice. He stated he never got caught; he was “fast runner.” He recalls one particularly good place behind a dump and that the waterfalls located near where the old Markleeville road forked from highway 50, had always been regarded “the best place”, since the fish pooled there. These fishing forays were for his own use and he didn’t know about anything selling that took place; his friends just caught what they could eat or take home.

Sometimes they would drive to go fishing other places; Taylor Creek was another “favorite place” but he thinks Upper Truckee was the best fishery. He never saw any remains of former fishing practices (nor did he expect to). He was never told about any traditional or ancient camping sites along the river in the project area. His grandfather (Ben James) knew about and had encountered water babies in the Taylor Creek area but Steve was never aware of any incidents and was never told to avoid certain areas because of their presence.

Mr. James said after the initial strangeness wore off, he actually enjoyed Stewart and stated it was a lot like the army. They marched to breakfast, worked half the day and had classes the other half. Their vocational training supported maintenance, construction, and food production for the school. Cobblers repaired the children’s school shoes, etc. Steve worked mainly on the farm, milking cows. He said the children didn’t choose which vocations they were to receive training in - they did what they were told and worked where they were needed.

Mr. James does not recall going back to Tahoe for summer work after high school, and was drafted in 1953, serving 16 months in Korea. He remembers that many of his peers were going, and the big dinners given by the families before boys were shipped out and when they returned. He stated that the ranks were not segregated and that it all seemed to work.

After the Army, Mr. James went to a BIA vocational school in Chicago and became an electrician. One of his sons is also an electrician. Mr. James is retired and contributes many hours a week working on curriculum and with students at the Washoe language immersion school in Dresslerville.

III.K SOCIOECONOMICS

III.K.1 Issues

There are no major socioeconomic issues associated with the proposed project alternatives.

III.K.2 Analysis Methods and Assumptions

III.K.2.1 Impact Analysis Methods

The method of analysis is to identify the significant socioeconomic activities and issues in the project area, and then describe the project environment before and after river restoration. In general, this analysis indicates there will be insignificant impacts as a result of the project. Additionally, some positive socioeconomic benefits can be expected during the planning and construction phases. IMPLAN, a regional input-output model, will be used to quantify these benefits. A more complete description of IMPLAN can be found in the Summary of Impacts portion of this analysis.

III.K.2.2 Assumptions

- The project will not interfere with local economic activity.
- The project will not cause a reduction in income or employment for airport operations or grazing activities.
- The regional economy is driven by tourism, which is dependent on the unique natural environment of the Tahoe area.
- Construction project workers will be residents of El Dorado County (CA), Douglas County (NV), and Carson City (NV), and their spending will contribute to economic activity in these areas.

III.K.2.3 Cumulative Actions Considered

It can be anticipated that this and other similar restoration projects along the Upper Truckee River and in the greater Tahoe Basin will cumulatively improve social and economic future conditions by helping to preserve the environment that attracts visitors to the area. There is little data to identify what these cumulative affects might be.

This project would be undertaken simultaneously with the implementation of a revised grazing plan for the pasture acreage along Reaches 1 and 2. The Natural Resource Conservation Service (NRCS) and the property owners are currently developing the grazing plan for the Barton-Ledbetter Meadows. The previous and revised grazing plans are based on a Deferred Rotational System that allows one of several fenced grazing areas to recover from grazing on a rotational basis.

The current areal distribution of grazing areas is not well balanced. This results in an economic hardship when the larger areas are due for deferral. The revised plan proposes additional cross fencing, gates, water lines and troughs to create a roughly equal set of grazing areas. These revisions are expected to benefit the environment by minimizing overgrazing and the rancher with more consistent year-to-year grazing practices.

III.K.3 Affected Environment

III.K.3.1 Area of Influence

This section describes the existing socioeconomic conditions in the project area. The proposed project lies entirely within the South Lake Tahoe Community Region as defined by the USDA Forest Service (USFS) in the Lake Tahoe Watershed Assessment (LTWA), which lies entirely within El Dorado County, California (USFS, 2000).

The South Lake Tahoe Community Region (Figure III.K.1) includes the area from the California/Nevada state line along the southern and western shore of Lake Tahoe just beyond Meeks Bay in El Dorado County. To the southwest, it includes Echo Lake and the US Highway 50 corridor to just beyond Strawberry to include socioeconomic activities associated with the Sierra-at-Tahoe Resort.

III.K.3.2 Existing Conditions

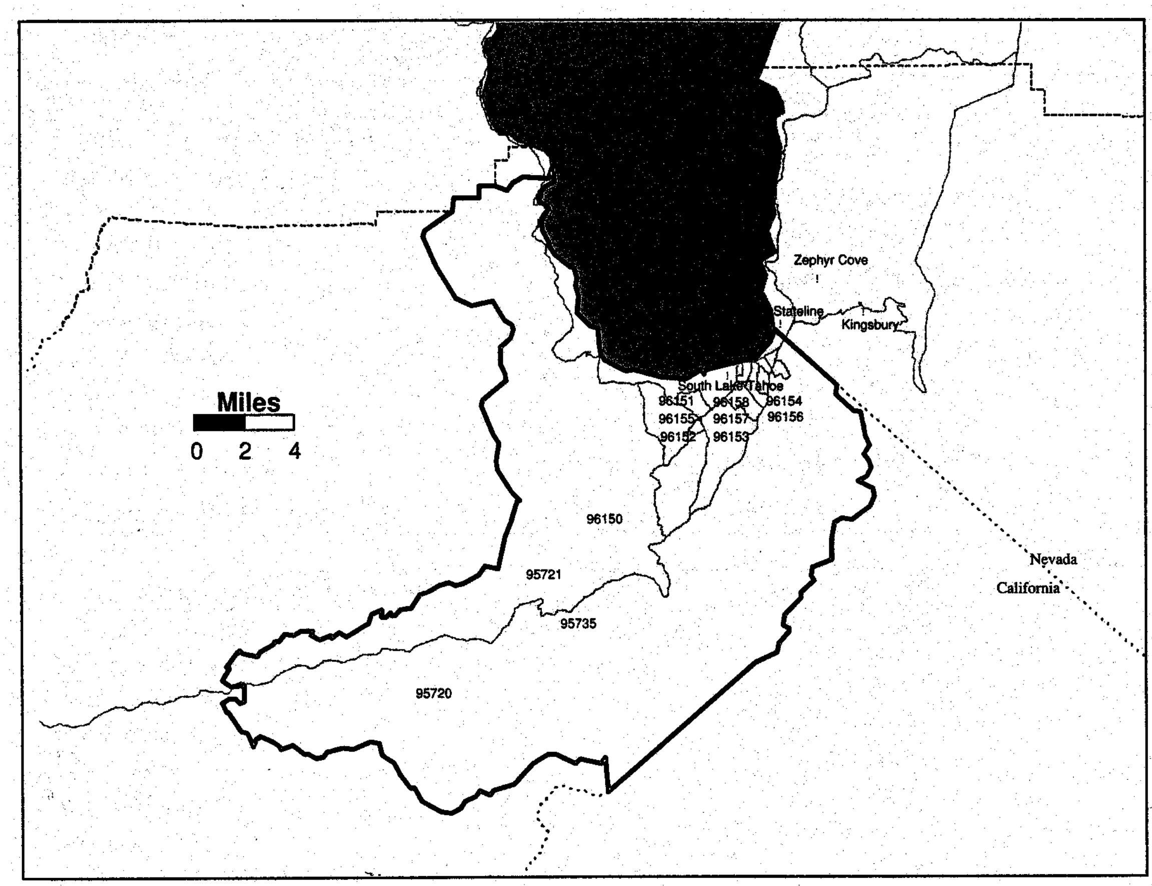
III.K.3.2.1 Economic Considerations

The economic conditions of the South Lake Tahoe community region are described at the end of section e. in Table III.K.1. These data come from a model developed by Economic Modeling Specialists, Inc. in 1998 (USFS, 2000). The total before tax income of persons living within the community, or residents' income, is roughly $800 million annually. The annual average of monthly employment as reported in the table is about 16,000 jobs. This figure includes both full time and part time jobs. The amusement and recreation industry supplies 19.2 percent of the region's employment, constituting the region's largest employer. Wages, salaries, and proprietors' income for the region are represented in the table under "Earnings", and totals almost $330,000. The medical, educational, and social services industry provides the largest contribution to regional earnings at 15.2 percent.

Tourist visitation to the South Lake Tahoe region plays a major part in the local economy. Table III.K.2, also taken from the LTWA, illustrates this role. This river restoration project should improve the attractiveness of this region and therefore have a positive, but minor, impact on visitor spending in the region. Visitation to the South Lake Tahoe Community Region makes up 24 percent of total visitation to the Lake Tahoe Basin. In addition, estimated visitor spending for the region is $68.5 million, comprising 17 percent of visitor spending for the entire basin.

Other economic activities specifically within the project area include the Lake Tahoe Airport and the Barton-Ledbetter Meadow. Lake Tahoe Airport has a single runway that is serviced full length by a parallel taxiway and six connecting taxiways. The runway is constructed to serve dual-wheel aircraft at 125,000 pounds maximum gross landing weight. Barton-Ledbetter Meadow is private property used primarily for cattle grazing. The meadow operations were described above in the Cumulative Actions section.

Figure III.K.1: South Lake Tahoe Community Region



Source: USFS, 2000

III.K.3.2.2 Population Growth

The population of the City of South Lake Tahoe has increased from 21,586 in 1990 to 23,609 in 2000, according to the US Census Bureau – an increase of 9.4 percent. In the LTWA, the population of the entire Tahoe Basin was estimated to be 52,591 in 1990. The population of the basin has remained relatively constant over the past decade, reaching an estimated 55,000 in 1998. This is a growth rate of 4.6% (USFS, 2000).

III.K.3.2.3 Public Services / Utility Considerations

The project area lies entirely within the South Tahoe Public Utility District (STPUD) service area. SLTPUD has over 12,000 residential water connections, 16,800 sewer connections, and a 7.7 MGD treatment plant that treats 1.8 billion gallons annually. This project will not impact these public services (STPUD, 2002).

Table III.K.1 South Lake Tahoe Community Region economic profile

South Lake Tahoe	(x $1,000)			
Labor Income by Place of Work	$329,522			
Less Incommuting Income	-$39,953			
Labor Income by Place of Residence	$289,569	91.3%		
Property Income	$27,477	8.7%		
Total Inside Income	$317,046	100.0%	39.5%	
Property Income	$76,692	15.8%		
Transfer Payments	$114,833	23.7%		
Outcommuters Income	$244,907	50.5%		
Income of non-working Part-Time Residents	$48,949	10.1%		
Total Outside Income	$485,381	100.0%	60.5%	
Total Residents Income	$802,427		100.0%	
Labor Income and Jobs by Industry	Jobs	%	Earnings	%
Agriculture & agricultural services	216	1.4%	$2,651	0.8%
Mining, sand and gravel	--	0.0%	--	0.0%
Construction	901	5.7%	$30,553	9.3%
Food processing	5	0.0%	$103	0.0%
Wood products	13	0.1%	$317	0.1%
Misc. manufacturing	73	0.5%	$1,452	0.4%
Transportation	272	1.7%	$6,312	1.9%
Publishing and communications	217	1.4%	$6,386	1.9%
Public utilities	192	1.2%	$14,091	4.3%
Trade	2,407	15.2%	$49,843	15.1%
Motels, eating and drinking	2,988	18.8%	$44,166	13.4%
Finance, insurance, and real estate	1,199	7.6%	$19,033	5.8%
Amusement and recreation	3,040	19.2%	$30,779	9.3%
Consumer services	502	3.2%	$11,243	3.4%
Business services	662	4.2%	$16,905	5.1%
Medical, educational, and social services	1,668	10.5%	$50,200	15.2%
Federal government	192	1.2%	$5,868	1.8%
State and local government	1,321	8.3%	$39,618	12.0%
TOTAL	15,869	100.0%	$329,522	100.0%
Source: USFS, 2000				

Table III.K.2 Visitation to the South Lake Tahoe Community Region

	South Lake Tahoe Community Region	Total Lake Tahoe Basin
Visitor Days	621,400	2,600,000
Percent of Total Visitation to the Lake Tahoe Basin	24%	100%
South Lake Tahoe Community Region estimated visitor spending by economic sector		
Economic Sector	$/Visitor Day	Total Annual Spending ($1,000)
Food Stores (450)	5.20	3,231
Service Stations (451)	0.30	186
Eating & Drinking (454)	16.00	9,942
Miscellaneous Retail (455)	2.75	1,708
Hotels & Lodging Places (463)	31.00	19,263
Amusement and Recreation (488)	55.00	34,177
Total	110.25	68,507
Source: USFS, 2000		

III.K.4 Environmental Consequences

An action is considered to have a significant negative socioeconomic impact if any income, jobs, or wages and salaries are lost due to the action.

III.K.4.1 Anticipated Impacts

III.K.4.1.1 Proposed Alternative 1

If implemented in Reach 1, the No-Action Alternative could have negative economic impacts. Without correction, over time the gully channel will continue to expand, causing additional drying of the meadows and reducing productive private pastureland. No negative economic impacts would occur under this alternative for all other reaches.

III.K.4.1.2 Proposed Alternative 2

The Moderate Enhancement Plan implemented in Reach 2 involves permanently diverting airport runoff onto the grazing property (verifying). The Lake Tahoe Airport and Tahoe Resource Conservation District (TRCD) have collected water quality data indicating the water is clean and will provide this data to the landowner if requested. The agreement of the landowner with this action indicates that there will be no negative economic impact on grazing operations.

If implemented in Reaches 1, 3, 4, 5, and 6, the Moderate Enhancement Plan would have no negative economic impact. The employment and wages generated by construction will have a temporary positive benefit. These positive benefits are quantified below in Table

III.K.3, along with the benefits of the Full Enhancement Plan, in the Summary of Impacts section.

III.K.4.1.3 Proposed Alternative 3

For Reaches 1 through 3, the Full Enhancement Plan consists of the Moderate Enhancement Plan of the individual reach and some additional enhancements particular to each reach. For the first three reaches these additional enhancements would not cause any negative economic impacts. The Full Enhancement Plan is the same as the Moderate Enhancement Plan for Reach 4.

For Reach 5, the Full Enhancement Plan involves constructing a new channel of the proper size and depth and filling the old channel to floodplain elevations and re-vegetating it. The new channel would be located at sufficient distance away from the airport runway to eliminate any potential airport-related negative impacts. No negative economic impacts would result from this alternative.

The Full Enhancement Plan for Reach 6 also consists of constructing a new channel. No negative economic impacts are expected.

Temporary economic benefits can be expected with each implementation of the Full Enhancement Plan because of the employment and wages generated by construction. These benefits are quantified in the following section.

III.K.4.1.4 Summary of Impacts

Table III.K.3 measures the positive economic benefit that each alternative of the proposed project will have on income and employment in the El Dorado County, Douglas County, and Carson City Region (Region). The impacts are quantified using the IMPLAN input-output (I-O) modeling system and database. This I-O analysis estimates total impacts on income and employment for the Region based on the direct change in economic expenditure that will occur if the project is undertaken.

Regional I-O analysis is used to quantify economic impacts associated with backward trade linkages. IMPLAN is an I-O tool and database that can estimate indirect and induced economic impacts caused by river restoration construction in individual counties or aggregations of counties. In I-O terminology, direct economic impacts refer to the effects of purchases of the products of an economic sector on jobs and income within that sector. Indirect effects are jobs and income generated when those revenues are spent on the inputs needed by that sector. Induced effects are the jobs and income that result from the spending of wages and salaries by people employed in the directly affected sector. The IMPLAN database contains 528 sectors.

Table III.K.3 Income and Employment Benefits of Most Likely Alternatives to El Dorado County, Douglas County, and Carson City Region

Reach	Alternative	Estimated Cost	Income Multiplier	Estimated Income Total	Employment Multiplier	Estimated Employment Total
1	Moderate Enhancement Plan (MEP)	$1,451,128	0.5915	$858,994	13.6514	20
1	Full Enhancement Plan (FEP)	$1,539,922	0.5915	$911,555	13.6514	21
2	MEP	$659,093	0.5915	$390,150	13.6514	9
2	FEP	$290, 329	0.5915	$171,860	13.6514	4
3	MEP	$3,318,475	0.5915	$1,964,368	13.6514	45
3	FEP	$2,361,066	0.5915	$1,397,631	13.6514	32
4	MEP	$190,613	0.5915	$112,833	13.6514	3
4	FEP	$190,613	0.5915	$112,833	13.6514	3
5	MEP	$3,598,394	0.5915	$2,130,066	13.6514	49
5	FEP	$2,938,650	0.5915	$1,739,531	13.6514	40
6	MEP	$1,095,185	0.5915	$648,294	13.6514	15
6	FEP	$4,708,795	0.5915	$2,787,367	13.6514	64
Total MEP		$10,312,888	--	$6,104,705	--	141
Total FEP		$12,029,375		$7,120,777		164

This analysis includes I-O analysis of economic impacts of investment in the sand and gravel mining sector of the Region. This particular industrial sector was chosen because it is the closest IMPLAN sector to the type of construction being carried out with this project. Sand and gravel mining is more similar than any other IMPLAN sector to this project's construction phase in terms of type & quantity of equipment used, man-hours worked, and other economic variables. In this analysis 1997 data from IMPLAN are used because they are the most recent that are available.

The Table III.K.3 results indicate that the estimated total cost of construction of each alternative for each project reach will result in the generation of an estimated $6,104,705 of additional income and an estimated 141 jobs for the Region under the Moderate Enhancement Plan. The Full Enhancement Plan will generate an estimated $7,120,777 of additional income and an estimated 164 additional jobs. Income is wages and salaries and value of benefits; employment (or jobs) is in full-time equivalents.

III.K.4.2 Unavoidable Adverse Impacts

For this river restoration project no socioeconomic impacts have been found. It has been an objective of the TRCD to see that the Lake Tahoe Airport and the private grazing land are not adversely affected. A number of positive impacts, however, have been reported.

IV. GRANT FUNDING AGENCY, GRANT RECIPIENT, LIST OF PREPARERS, CONSULTANTS, DIRECTING COMMITTEE, SCIENTIFIC REVIEW, TECHNICAL ADVISORY COMMITTEE, UPPER TRUCKEE RIVER WATERSHED ADVISORY GROUP, AND DISTRIBUTION.

IV.A GRANT FUNDING AGENCY

U. S. Bureau of Reclamation
Ms. Laura Allen, Deputy Regional Environmental Officer
2800 Cottage Way
Sacramento, CA 95825

IV.B GRANT RECIPIENT

Tahoe Resource Conservation District
P.O. Box 10529
South Lake Tahoe, CA 96158
Attention: Tim Oliver
E-mail: toliver@etahoe.com

IV.C LIST OF PREPARERS

Consultants
Ms. Sue Fox
Wildlife Resource Consultants
P.O. Box 8493
Truckee, CA 96162
Phone: 530-550-0206
E-mail: sfox@gbis.com

Ms. Susan Lindstrom, Consulting Archaeologist
P.O. Box 3324
Truckee, CA 96160
Phone: 530-587-7072
Fax: 530-587-7083
E-mail: slindstrom@jps.net

Mr. Thomas F. Quasebarth
Stefan Schuster
Camp Dresser & McKee Inc.
P.O. Box 1189
Zephyr Cove, NV 89448
Quasebarth
Phone: 916-708-3754
E-mail: quasebartht@cdm.com
Schuster
Phone: 775-588-0201
Fax: 755-588-0190
E-mail: schustersl@cdm.com

Ms. Leisa Phillips
Integrated Environmental Design
776 Oak Street
Ashland, OR 97520
Phone: 541-899-1773
Cell: 541-941-8006
E-mail: iedleisa@internetcds.com

Mr. Mitchell Swanson
Swanson Hydrology & Geomorphology
115 Limekiln Street
Santa Cruz, CA 95060
Phone: 831-427-0288
Fax: 831-427-0472
E-mail: swanson@swansonh2o.com

Mr. Paul Sweeney
Natural Resources Conservation District
P.O. Box 10529
South Lake Tahoe, CA 96158
Phone: 530-573-2764
Fax: 530-573-2779
Email: paul.sweeney@ca.usda.gov

IV.D COORDINATION

IV.D.1 Directing Committee

Mr. Brian Wilkinson
California Tahoe Conservancy
2161 Lake Tahoe Blvd, Suite 2
South Lake Tahoe, CA 96150

Mr. Joe Pepi
California Tahoe Conservancy
2161 Lake Tahoe Blvd, Suite 2
South Lake Tahoe, CA 96150

Mr. Steve Peck
City of South Lake Tahoe
1900 Lake Tahoe Boulevard
South Lake Tahoe, CA 96158

Mr. Paul Sweeney
Natural Resources Conservation District
870 Emerald Bay Road
South Lake Tahoe, CA 96150
Mailing Address
P.O. Box 10529
South Lake Tahoe, CA 96158

Ms. Kim Melody
Mr. Tim Oliver
Tahoe Resource Conservation District
870 Emerald Bay Road
South Lake Tahoe, CA 96150
Mailing Address
P.O. Box 10529
South Lake Tahoe, CA 96158

Scientific Review
Mr. Eric Larson
University of California at Davis
One Shield Avenue
Davis, CA 95616

IV.D.2 Technical Advisory Committee

U. S. Bureau of Reclamation
Ms. Laura Allen, Deputy Regional Environmental Officer
2800 Cottage Way
Sacramento, CA 95825

Mr. Steve Peck
Mr. Russ Wigart
Ms. Lisa O'Daly
City of South Lake Tahoe
1900 Lake Tahoe Boulevard
South Lake Tahoe, CA 96158

Mr. Mike Dikun
City of South Lake Tahoe, Lake Tahoe Airport
1901 Airport Road, Suite 100
South Lake Tahoe, CA. 96150

Mr. Brian Wilkinson
Mr. Joe Pepi
California Tahoe Conservancy
2161 Lake Tahoe Blvd, Suite 2
South Lake Tahoe, CA 96150

Mr. Richard Solbrig
Mr. Ken Schroeder
Mr. Jim Hoggatt
South Tahoe Public Utility District
1275 Meadow Crest Drive
South Lake Tahoe, CA 96150

Mr. Jim Howard
U. S. Forest Service
870 Emerald Bay Road
South Lake Tahoe, CA.96150

Mr. Steve Kooyman
County of El Dorado
924 B Emerald Bay Road
South Lake Tahoe, CA 96150

Mr. Eric Larsen
University of California Extension
One Shield Avenue
Davis, CA 95616

Ms. Mary Fiore-Wagner
California Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Mr. Paul Sweeney
Mr. Chuck Taylor
Natural Resources Conservation District
870 Emerald Bay Road
South Lake Tahoe, CA 96150
Mailing Address
P.O. Box 10529
South Lake Tahoe, CA 96158

Mr. Bill Frost
U C Extension
311 Fair Lane
Placerville, CA 95667

Mr. Larry Benoit
Mr. Tim Hagan
Tahoe Regional Planning Agency
308 Dorla Court
P. O. Box 1038
Zephyr Cove, NV

Mr. Bill Mosher
7635 Sloughhouse Road
Elk Grove, CA 95624

IV.D.3 Upper Truckee River Watershed Advisory Group

Ms. Dawn Armstrong
Ms. Heather Schmitt
Mr. Jim Mitchell
Mr. Kirk Ledbetter
Ms. Liz Watson
Mr. and Mrs. Rich and Rhodes
Mr. and Mrs. Joel Williams
Mr. Brian Wilkinson

IV.E DISTRIBUTION

To all interested parties