Water Quality Management Plan for the Lake Tahoe Region

Volume III.
SEZ Protection and Restoration Program

TAHOE REGIONAL PLANNING AGENCY

November 30, 1988

WATER QUALITY MANAGEMENT PLAN
FOR THE
LAKE TAHOE REGION

VOLUME III. STREAM ENVIRONMENT ZONE PROTECTION AND RESTORATION PROGRAM

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WATER QUALITY MANAGEMENT PLAN

FOR THE

LAKE TAHOE REGION

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I. INTRODUCTION

Stream environment zone (SEZ) is a term used to denote the major and minor streams, intermittent streams, drainage ways, meadows and marshes, and other areas of water influence within the Lake Tahoe Region. The term applies equally to areas where surface and subsurface waters are involved. The term wetlands is specifically used to refer to areas where standing water or saturated soils are present most of the year.

Disturbance of stream environment zones can reduce their capability to convey spring snowmelt, storm water, and other forms of surface runoff from the slopes of the Tahoe Region to Lake Tahoe and its tributaries. Disturbance also reduces the natural water cleansing capabilities of these areas. Maintaining these areas in as natural a state as possible ensures their capability to convey and treat water which is necessary for attaining environmental thresholds for water quality.

TRPA has identified sixty-four major watersheds in the Lake Tahoe Region. Many of the stream environment zones in these areas have been disturbed or modified by development. Many are still intact and are being preserved.

The Tahoe Regional Planning Agency's 208 plan concentrates its efforts on the declining water quality of Lake Tahoe. Human activity, especially urban development, is altering the water quality of the Lake. One of the main sources of sediment and nutrients is surface runoff. Under natural conditions, surface runoff entering Lake Tahoe has very low concentrations of suspended sediment and nutrients. New development increases the volume of surface runoff, which, without proper controls, will degrade the quality of the surface runoff water. The 208 planning effort includes the following remedial programs for water quality:

1. Region-wide application of Best Management Practices (BMPs),

2. Erosion and runoff control Capital Improvements Program (CIP), and

3. Stream Environment Zone Protection and Restoration Program.

This volume of the Water Quality Management Plan addresses stream environment zones, their importance, function, identification, management, and restoration.

II. IMPORTANCE OF SEZs

The major importance of SEZs is their ability to provide natural treatment and conveyance of surface runoff. Encroachment into these areas reduces their potential to filter sediment and nutrients and also reduces the amount of surface runoff they can

effectively treat. In addition, natural SEZs provide open space, flood flow capacity, riparian vegetation, and fish and wildlife habitat, and buffer urban uses in developed areas.

SEZs are capable of conveying surface runoff to Lake Tahoe while removing sediment and nutrients. The natural treatment capacity of SEZs can be seen in Table 1 by comparing the concentrations of samples collected above, midway, and below an SEZ in South Lake Tahoe (TRPA, 1977c). The table shows a reduction in the concentrations of the pollutants sampled. This reduction was attributed to the fact that the riparian vegetation and the undisturbed soils in the area were filtering out the sediment and nutrients. A study conducted by the EPA in 1977 and 1978 also indicated that SEZs in the Tahoe Basin are effective for removing sediment and nutrients from surface runoff (Morris, 1981). This unreplicated study indicated that the natural treatment capability is reduced in SEZs where development causes channelized flow. Also, channelized SEZs may actually increase sediment and nutrient loadings in areas where erosion is caused by concentrated surface runoff. Disturbing the SEZs reduces their natural treatment capabilities. Past development practices in the Tahoe Region have allowed meadows to be filled and structures to be constructed in SEZs. Current TRPA policies and ordinances prohibit encroachment in SEZs (with certain exceptions) and mandate the restoration of a certain amount of disturbed, altered, or modified SEZs.

The riparian vegetation associated with SEZs is a critical component of the Tahoe Region's natural vegetation. This riparian vegetation provides critical wildlife habitat, especially the edge effect created by the boundary of the riparian vegetation and the coniferous forest. The SEZs also enhance recreational opportunities and scenic quality in the Region. The soils of the SEZs are very productive and support a wide diversity of plant species. Protection and restoration of SEZs are essential for improving and maintaining the environmental amenities of the Tahoe Region and for achieving environmental thresholds for water quality, vegetation preservation, and soil conservation.

TABLE 1. Natural Treatment Capability of SEZs
(TRPA, 1977c)

Station Location	Suspended Solids (mg/l)		Total Nitrogen as N (mg/l)		Phosphate as PO_4 (mg/l)	
	n	x	n	x	n	x
Above	30	493	18	1.424	28	.982
Midway	8	162	6	.300	8	.019
Below	20	29	16	.395	18	.141
Percent Reduction in Concentration	94%		73%		86%	

mg/l = milligrams per liter
n = number of samples
x = mean concentration

III. BACKGROUND ON SEZs

In the 1970's, TRPA prepared a regional land-use plan, based on a land capability rating system developed by the Forest Service, TRPA, and the Soil Conservation Service (Bailey, 1974). The primary criteria for determining land capability were slope, soil unit, and susceptibility to floods, landslides, and high water tables. Although the term stream environment zone (SEZ) was not used in the Bailey Report, certain low capability (class 1) lands were identified on the basis of susceptibility to floods and high water tables.

In 1971, the value of buffers adjacent to streams was identified in Hydrology and Water Resources of the Lake Tahoe Region, (TRPA, 1971a). The report stated that stream quality can be protected by preserving buffers of undeveloped land adjacent to streams. These buffers can filter out some pollutants and provide shade for the stream water. The report added that changes in land use sometimes produce undesirable environmental effects, such as increasing runoff, amplifying flood peaks, and attenuating base flows. The report proposed that "streamside environmental zones" be established using two different procedures:

1. On virtually level flood plain land, the zone was established by using the official 100-year flood plain developed by the U.S. Corps of Engineers plus the lesser of 100 feet horizontally or 25 feet vertically, or by using the historic flood plain based on geologic evidence plus the lesser of 100 feet horizontally or 25 feet vertically.

2. On steeper terrain, an on-site determination of the zone was to be conducted before any development was started along any stream course. The determination was to be based on the dependent factor of maintaining existing water quality and the independent factors of:

    1. geology,
    2. types and density of vegetation,
    3. soil type, and
    4. slope.

The term "streamside environmental zone" was shortened to "stream environment zone" in 1977. In 1977, the report Stream Environment Zones and Related Hydrologic Areas of the Lake Tahoe Basin (TRPA, 1977a) outlined the value of SEZs, the identification of SEZs, and the importance of preserving and/or restoring SEZs. The factors used to identify SEZs in this report are discussed in the following chapter.

The definitions and procedures used to delineate the boundaries of the SEZ were firmly established in chapter III of the Handbook of Best Management Practices (TRPA, 1978). The BMP Handbook provided guidelines on the identification of SEZs and the restrictions on disturbance within SEZs. Again, the planning criteria to delineate SEZs as established by the BMP Handbook are detailed in the next chapter. Although the procedures have been in use for over 10 years, TRPA's Goals and Policies (TRPA, 1986) call for a review of the SEZ procedures and the establishment of new ones that more accurately identify SEZs.

The development in 1986-1988 of the Individual Parcel Evaluation System (IPES) with its related procedures and planning criteria provided the impetus for reviewing and modifying the established SEZ criteria. The IPES Technical Committee, which is composed of professional hydrologists, planners, soil scientists, and engineers developed a more comprehensive procedure to be used in the identification of SEZs based on the presence of key indicators and secondary indicators. These indicators are described in the following chapter. These criteria and procedures will become the established methodology to determine SEZs on January 1, 1989, or as soon as the 208 plan is implemented.

IV. IDENTIFICATION OF SEZs

The identification of SEZs has been documented in the following three publications:

1. Stream Environment Zones and Related Hydrologic Areas of the Lake Tahoe Basin (TRPA, 1977a),
2. Water Quality Management Plan Volume II. Handbook of Best Management Practices (TRPA, 1978), and
3. Chapter 37 - Individual Parcel Evaluation System. Code of Ordinances (TRPA, 1987a).

The first two publications form the basis for the identification of SEZs in the 1981 208 plan. The third one, IPES criteria, includes proposed modifications which will become effective on January 1, 1989.

Table 2 shows the six factors and their definitions of SEZs in Stream Environment Zones.... (TRPA, 1977a).

The stream environment zones were circumscribed by drawing the continuous boundary of the soil type, vegetation, flood plains, and minimum buffer strip on a base map containing information on the presence of water and areas of topographic depression. The boundary furthest from the stream or drainageway was marked as the stream environment zone boundary. For example, if the flood plain boundary was further from the stream than the riparian vegetation

TABLE 2. SEZ Identification Factors (TRPA, 1977a)

Factors		Definitions	
1.	Major rivers, streams, creeks, lakes, ponds, marshes, and wetlands.	1.	Areas where water is flowing or standing, either year round or on a seasonal basis.
2.	100-year flood plains	2.	Areas which are subjected to carrying the 100-year flood flows.
3.	Areas of topographic depression	3.	Areas which carry or hold water, generally on a seasonal or intermittent basis.
4.	Riparian vegetation	4.	Vegetation, such as, alders, willows, aspen, and lodgepole pine which are usually found along the banks of drainageways, streams, or rivers and near areas with standing water, springs, or ground water.
5.	Alluvial soils	5.	Lo, Ev, Co, Mh, and Gr soil types.
6.	Buffer strip	6.	Minimal area on both sides of the SEZ to insure the inclusion of the total area and protection from development; for streams, 25 to 100 feet.

boundary or the alluvial soil boundary, then the flood plain boundary became the stream environment zone boundary. Where the boundary of one characteristic--flood plain, alluvial soil, vegetation, or minimum buffer strip--crossed the boundary of another characteristic, the boundary of the characteristic further from the stream channel became the boundary of the stream environment zone. If only one of the factors was present, such as alluvial soil or riparian vegetation, then the boundary of that factor delineated the SEZ. If all six factors were present, the area was most likely to be correctly identified as an SEZ. However, when only one factor was present, identification as an SEZ was less certain, especially in the field.

The Handbook of Best Management Practices (TRPA, 1978) refined the criteria to be used in identifying SEZs. The areas of topographic depression were redefined as drainageways and included in factor No. 1, as shown in Table 2. The definition of riparian vegetation was slightly modified and the types of riparian vegetation were enlarged. Fill land (soil type Fd) was added to the five soil types listed previously as belonging to Land Capability Classification 1b. The 100-year flood plain and the buffer strip were basically unchanged. The buffer strip for major streams (third order or greater) was clarified. This buffer strip was to be 100 feet measured from the sides of the channel, whereas, on drainageways, first and second order streams, the buffer strip was measured from the centerline.

The following definitions were used with respect to the identification criteria for SEZs.

1. Stream Environment Zone - That region: 1) which surrounds a stream, including major streams, minor streams and drainageways, which owes its biological and physical characteristics to the presence of water; 2) which may be inundated by a stream; or 3) in which actions of man or nature may directly or indirectly affect the stream. A stream includes small lakes, ponds, and marshy areas through which the stream flows.

1a. Major Stream - A continuously flowing stream and its associated hydrologic characteristics, usually identified as a permanent stream on a U.S. Geological Survey (USGS) topographic map, 7.5-minute series. These are third or higher order streams.

1b. Minor Stream - Either an intermittently flowing stream or a permanent stream with extremely low flow during all or part of the year. Such minor streams usually are identified as intermittent streams on USGS topographic maps, 7.5-minutes series. These are second order streams.

1c. Drainageway - A topographic depression which conveys surface water to major or minor streams or other receiving waters. Drainageways may not be identified on USGS topographic maps, may not normally contain flowing water, and may flow only during storms and snowmelt periods. These are first order streams.

2. 100-year Flood Plain - The limits of the Intermediate Regional Flood were established by the U.S. Army Corps of Engineers.

3. Riparian Vegetation - Vegetation normally found only along the banks of streams and rivers, and usually characterized by the lush green color of deciduous vegetation contrasted with the darker green of coniferous vegetation or by increased density of vegetation along waterways, including the following vegetation types:

Herbaceous
Riparian shrub
Lodgepole Pine below 7,600 feet
Broadleaf
Grassland
Woodland
Woodland - Grass

4. Alluvial Soil Type - All of the following soil types which owe their major characteristics to the presence of surface or subsurface water:

Loam alluvial land (Lo)
Elmira loamy coarse sand, wet variant (Ev)
Celio gravelly loamy coarse sand (Co)
Marsh (Mh)
Gravelly alluvial land (Gr)
Fill land (Fd)

These soil types were placed in Land Capability Classification 1b. The only 1b soil not included was Beaches (Be), which owes its characteristics to the presence of a lake and wave action, rather than the present of streams.

5. Minimum Buffer Strip - A strip of land containing the stream or drainage channel and a designated width of land which is considered the minimum width necessary to protect the integrity of the various characteristics of the stream environment zones.

5a. First Order Stream - Any mapable unbranched tributary with a buffer strip of 25 feet on each side of the centerline.

5b. Second Order Stream - A stream formed by the confluence of two or more first order streams with a buffer strip of 50 feet on each side of the centerline.

5c. Third Order Stream - A stream formed by the confluence of two or more second order streams with a buffer strip of 100 feet from each side of the stream channel.

Under the BMP Handbook (TRPA, 1978) the boundary of the factor which is furthest from the stream marked the SEZ boundary. Only one of the five factors needed to be present in order to delineate an SEZ.

TRPA has modified the criteria for identifying SEZs, in accordance with the Goals and Policies. The criteria developed for IPES by the IPES Technical Committee will be applied throughout the Tahoe Region, pursuant to Chapter 30 of the TRPA Code of Ordinances, upon certification and approval of the proposed 208 plan amendments.

The greatest difference between the SEZ criteria developed by the IPES Technical Committee (TRPA, 1987a) and the criteria of the BMP Handbook (TRPA, 1978) is the buffer strip/setback concept. The buffer strip as described in the 1978 BMP Handbook is dependent on stream order, whereas the setback in IPES is dependent on the condition and sensitivity of the SEZ. Under IPES, the width of such setbacks is related to the sensitivity of the SEZ, particularly in terms of channel type and stability. Under the BMP Handbook, the buffer strip is dependent only on the stream order.

The definitions and criteria which replace the criteria of the 1978 BMP Handbook are as follows:

Definitions:

1. Alluvial Soils - All the following soil types owe their major characteristics to the presence of surface or subsurface water:

   (a) Loamy alluvial land (Lo)
   (b) Elmira loamy coarse sand, wet variant (Ev)
   (c) Celio gravelly loamy coarse sand (Co)
   (d) Marsh (Mh)
   (e) Gravelly alluvial land (Gr)
   (f) Fill land (Fd)

2. Confined Stream - Stream types classified under major categories A and B, and stream type C21, as defined in the report entitled A Stream Classification System (Rosgen, 1985).

3. Designated Flood Plain - The limits of the Intermediate Regional Flood where established for creeks by the U.S. Army Corps of Engineers, or the limits of the 100-year flood where established for creeks by the U.S. Army Corps of Engineers.

4. Ephemeral Stream - Flows sporadically only in response to precipitation, with flows lasting a short time.

5. Groundwater Between 20-40 Inches - Evidence of ground water between 20 and 40 inches below the ground surface (somewhat poorly drained soil).

6. Intermittent Stream - Flows in response to precipitation or snow melt.

7. Lake - A water body greater than 20 acres in size, exceeding two meters deep at low water and lacking trees, shrubs, persistent emergents, emergent mosses or lichens with greater than 20 percent aerial coverage.

8. Man-Made Channel - A channel constructed by man for the purpose of conveying water or a channel created by water being discharged from a man-made source, such as a culvert or pipe.

9. Near Surface Groundwater - Evidence of ground water within 20 inches of the ground surface (poorly drained soil).

10. Perennial Stream - Permanently inundated surface stream courses. Surface water flows throughout the year except in years of infrequent drought. Perennial streams shall be those shown as solid blue lines on USGS Quad Maps, or streams determined to be perennial by TRPA.

11. Pond - A standing water body less than 20 acres in size and/or less than two meters deep at low water.

12. Primary Riparian Vegetation - The following vegetative community types as identified in the report entitled Vegetation of the Lake Tahoe Region, A Guide for Planning (TRPA, 1971b):

    (a) Type 0: Open water - Open water, swamps and pools and Vernal pools.

    (b) Type 2: Herbaceous - Wet marsh or meadow and Sphagnum bog.

    (c) Type 7: Riparian shrub - Willow thicket and alder thicket.

    (d) Type 9: Broadleaf - Low elevations.

13. SEZ Setbacks - A strip of land adjacent to the edge of an SEZ, the designated width of which is considered the minimum width necessary to protect the integrity of the various characteristic of the SEZ. The width of the setback shall be established in accordance with the procedure set forth in Subsection 37.3.D of the TRPA Code of Ordinances (Table 3).

14. Secondary Riparian Vegetation - The following vegetative types as identified in the report entitled Vegetation of the Lake Tahoe Region, A Guide for Planning (TRPA, 1971b):

    (a) Type 2: Herbaceous - Wet mesic meadow
    (b) Type 9: Broadleaf - High elevations
    (c) Type 19: Lodgepole - Wet type

15. Slope Condition - The condition of the slope located adjacent to the stream channel or edge of the SEZ shall be defined as follows. The extent of existing slope protection, which is defined as the percent cover of original duff layer, down logs, low growing vegetation or rock fragments greater than 1-2 inches in diameter, shall be given primary consideration when determining slope condition.

(a) Good - Slopes show little or no evidence of surface (sheet, rill, gully) erosion or mass wasting. Slopes are typically covered 90 percent or more with original duff layer, down logs, slash, low growing vegetation or rock fragments greater than 1-2 inches in diameter. Slope gradient is commonly less than 30 percent. Soil horizons are usually cohesive and consolidated.

(b) Average - Slopes show evidence of surface (sheet, rill, gully) erosion or mass wasting over 5 to 50 percent of the slope surface. Slopes are typically covered between 50 to 90 percent with original duff layer, down logs, slash, low growing vegetation or rock fragments greater than 1-2 inches in diameter. Slope gradient is commonly between 30 and 70 percent. Soil horizons are typically moderately cohesive and consolidated.

(c) Poor - Slopes show evidence of active and pronounced surface (sheet, rill, gully) erosion or mass wasting over more than 50 percent of the slope surface. Slopes are typically covered less than 50 percent with original duff layer, down logs, slash, low growing vegetation or rock fragments greater than 1-2 inches in diameter. Slope gradient is often greater than 70 percent. Soil horizons are typically non-cohesive and unconsolidated. Evidence of seeping is often present.

Terrace - A moderately flat land area, above the flood plain, generally less than 20 percent slope.

Unconfined - Stream types classified under major categories C (excluding stream type C2), D and E as defined in the report entitled A Stream Classification System (Rosgen, 1985).

Criteria:

A stream environment zone (SEZ) is determined to be present if any one of the following key indicators is present or, in absence of a key indicator, if any three of the following secondary indicators are present. Plant communities are identified in accordance with the definitions and procedures contained in the report entitled Vegetation of the Lake Tahoe Region, A Guide for Planning (TRPA, 1971b):

1. Key Indicators: Key indicators are:

   (a) Evidence of surface water flow, including perennial, ephemeral and intermittent streams, but not including rills or man-made channels;
   (b) Primary riparian vegetation;
   (c) Near surface groundwater;
   (d) Lakes or ponds;
   (e) Beach (Be) soil; or
   (f) One of the following alluvial soils:

      (i) Elmira loamy coarse sand, wet variant (Ev)
      (ii) Marsh (Mh).

2. Secondary Indicators: Secondary indicators are:

   (a) Designated flood plain;
   (b) Groundwater between 20-40 inches;
   (c) Secondary riparian vegetation;
   (d) One of the following alluvial soils:

      (i) Loamy alluvial land (Lo);
      (ii) Celio gravelly loamy coarse sand (Co; or
      (iii) Gravelly alluvial land (Gr).

The boundary of an SEZ is the outermost limit of the key indicators; the outermost limit where three secondary indicators coincide; or, if Lo, Co, or Gr soils are present, the outermost limit where two secondary indicators coincide, whichever establishes the widest SEZ at any point. The outermost boundaries of a stream are the bank full width of such stream, which is defined as the level of frequent high flow, i.e., the level of flood with a recurrence interval of approximately 1.5 years.

SEZ setbacks are established in accordance with the following criteria (Table 3):

1. Confined Perennial Stream: When a confined perennial stream is present, the following setbacks are established based on the corresponding slope condition:

   (a) Good Slope Condition: When the slope condition is identified as good, the setback is 25 feet from the edge of the SEZ or 15 feet from the edge of a terrace, if present, whichever is less.

(b) Average Slope Condition: When the slope condition is identified as average, the setback is 35 feet from the edge of the SEZ or 20 feet from the edge of a terrace, if present, whichever is less.

(c) Poor Slope Condition: When the slope condition is identified as poor, the setback is 60 feet from the edge of the SEZ or 35 feet from the edge of a terrace, if present, whichever is less.

2. Unconfined Perennial Stream: When an unconfined perennial stream is present, the setback is 50 feet from the edge of the SEZ.

3. Confined Ephemeral Or Intermittent Stream: When a confined ephemeral or intermittent stream is present the following setbacks are established based on the corresponding slope conditions:

(a) Good Slope Condition: When the slope condition is identified as good, the setback is 15 feet from the edge of the SEZ or 10 feet from the edge of a terrace, if present, whichever is less.

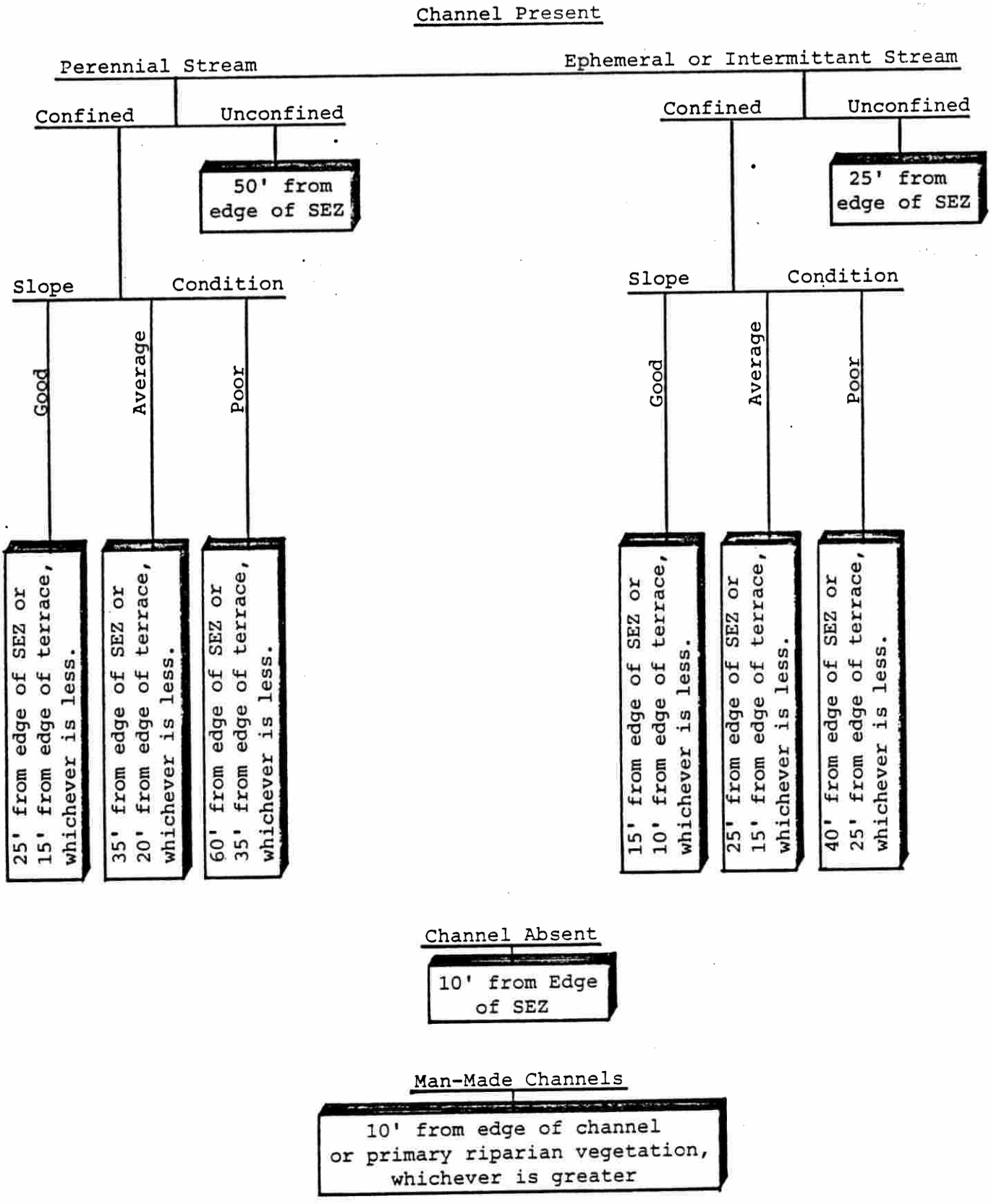
(b) Average Slope Condition: When the slope condition is identified as average, the setback is 25 feet from the edge of the SEZ or 15 feet from the edge of a terrace, if present, whichever is less.

(c) Poor Slope Condition: When the slope condition is identified as poor, the setback is 40 feet from the edge of the SEZ or 25 feet from the edge of a terrace, if present, whichever is less.

4. Unconfined Ephemeral Or Intermittent Stream: When an unconfined ephemeral or intermittent stream is present the setback is 25 feet from the edge of the SEZ.

5. Channel Absent: When there is an SEZ present but there is no associated channel identified, the setback is 10 feet from the edge of the SEZ.

Table 3. Setbacks From SEZs Using IPES Criteria



V. MANAGEMENT AND PROTECTION OF SEZs

As pointed out in the previous chapters on the background, importance, and identification of SEZs, the management and protection of SEZs was documented in the late 1970s in the following four publications:

1. Stream Environment Zones and Related Hydrologic Areas Of The Lake Tahoe Basin, (TRPA, 1977a),

2. Lake Tahoe Basin Water Quality Management Plan. Volume III. Assessment of Water Quality and Environmental Impacts, (TRPA, 1977b),

3. Lake Tahoe Basin Water Quality Management Plan. Volume I. Water Quality Problems and Management Program, (TRPA, 1977c), and

4. Lake Tahoe Basin Water Quality Management Plan. Volume II, Handbook of Best Management Practices, (TRPA, 1978).

It was considered imperative that restrictions on potentially developable stream environment zones be instituted to protect the lands which still retained the natural capacities for runoff conveyance and treatment. The design and construction restrictions and mitigation measures for use in SEZs were firmly established in the Handbook of Best Management Practices (TRPA, 1978). The overriding concerns regarding construction in SEZs were the maintenance of the biological and physical integrity of the area and the maintenance of the hydrologic capacity of the zone to pass a 100-year flood without increased damage to natural or human systems.

The procedures for construction techniques and practices provided in the BMP Handbook (TRPA, 1978) fell into the following categories: siting restrictions, design restrictions, construction restrictions, and mitigation measures.

The Thresholds Study Report (TRPA, 1982) recommended to continue the management and protection of SEZs and to establish the SEZ restoration program (see Chapter VI). The thresholds for the management, protection, and restoration of SEZs are essential for improving and maintaining the environmental amenities of the Lake Tahoe Basin, and are listed and discussed in Chapter VI.

SEZs are a subelement of the Conservation Element in the Goals and Policies (TRPA, 1986).

The Goals and Policies require that SEZs shall be protected and managed for their natural values, and that groundwater development in SEZs shall be discouraged when such development might impact associated plant communities or instream flow (Goals and Policies, pp. IV-23, 24).

In addition, no new land coverage or other permanent disturbance shall be permitted in SEZs except as follows (Goals and Policies, pp. IV-24, 25).

-- public outdoor recreation facilities if (1) necessary for a public agency's long range plans for public outdoor recreation, (2) consistent with the recreation element of the Regional Plan, (3) the project, by its nature, must be sited in an SEZ, (4) there is no feasible alternative which would reduce the extent of SEZ encroachment, (5) impacts are fully mitigated, and (6) SEZs are restored in an amount of 1.5 times the area of SEZ disturbed or developed for the project,

-- public service facilities if (1) necessary for public health, safety, or environmental protection, (2) there is no reasonable alternative, including spans, which avoids or reduces the extent of encroachment, (3) the impacts are fully mitigated, (4) SEZ lands are restored in an amount of 1.5 times the area of SEZ developed or disturbed by the project,

-- projects which require access across SEZs to otherwise buildable sites if (1) there is no reasonable alternative which avoids or reduces the extent of encroachment, (2) impacts are fully mitigated, (3) SEZ lands are restored in an amount 1.5 times the area of SEZ disturbed or developed by the project,

-- new development in man-modified SEZs where (1) the area no longer exhibits the characteristics of an SEZ, (2) further development will not exacerbate the problems caused by development in SEZs, (3) restoration is infeasible, and (4) mitigation is provided to at least partially offset the losses caused by modification of the SEZ, and

-- SEZ restoration and erosion control projects.

Replacement of existing coverage in SEZs may be permitted where the project will reduce impacts on SEZs and will not impede restoration efforts. Existing structures in SEZs may be repaired or rebuilt (Goals and Policies, p. IV-25).

Although the presence of the 100-year flood plain, alone, does not constitute an SEZ under the proposed amendments, development in the flood plain is still restricted. Construction, grading, and filling of lands within the 100-year flood plain is prohibited, except as necessary to implement the Goals and Policies. All

public utilities, transportation facilities, and other necessary uses located in the 100-year flood plain must be constructed and maintained to prevent damage from flooding and to not cause flooding (Goals and Policies, p. II-24). Development in the 100-year flood plain shall be found to be necessary to implement the Goals and Policies only for:

1. Public outdoor recreation facilities if: (1) the project is a necessary part of a public agency's long range plans for public outdoor recreation, (2) the project is consistent with the recreation element of the Regional Plan, (3) the project, by its very nature, must be sited in a flood plain, (4) there is no feasible alternative which would reduce the extent of encroachment in a flood plain, and (5) the impacts on the flood plain are fully mitigated,

2. Public service facilities if: (1) the project is necessary for public health, safety, or environmental protection, (2) there is no reasonable alternative, including spans, which avoids or reduces the extent of encroachment in a flood-plain, and (3) the impacts on the flood plain are fully mitigated,

3. Projects which require access across flood plains to otherwise buildable sites if: (1) there is no reasonable alternative which avoids or reduces the extent of encroachment in the flood plain and (2) the impacts on the flood plain are fully mitigated, and

4. Erosion control projects, habitat restoration projects, stream environment zone restoration projects, and similar projects provided that the project is necessary for environmental protection and there is no reasonable alternative which avoids or reduces the extent of encroachment in the flood plain.

In remote locations and other locations where TRPA or the Corps of Engineers has not yet prepared 100-year flood plain maps and TRPA has reason to believe that a flood hazard may exist, TRPA shall require project applicants to map the 100-year flood plain as part of their project applications. This policy is similar to the operating procedures the Lahontan Board follows in the portion of the Region in California at this time.

VI. SEZ RESTORATION PROGRAM

A. PROGRAM OBJECTIVES AND POLICIES

The program objectives and policies which govern the SEZ Restoration Program are found in the TRPA Thresholds, the Goals and Policies, the Plan Area Statements, and the Code of Ordinances.

1. ENVIRONMENTAL THRESHOLD CARRYING CAPACITIES

The Thresholds Study Report (TRPA, 1982) reported that the SEZ is one of the most effective natural mechanisms for providing nutrient removal and surface water conveyance from upland areas into Lake Tahoe and its tributaries. Encroachment on SEZs channelizes surface flow and causes increased channel erosion and damage to riparian soils and vegetation. Encroachment into SEZs by development activities also destroys those soils which are the most productive in the Basin in terms of vegetative growth and nutrient storage. Channelization of sheet flows to accommodate development causes increased erosional energy in the surface runoff and erosion of these soils which are then easily delivered to surface waters.

The TRPA threshold for maintenance and restoration of SEZs is:

PRESERVE EXISTING NATURALLY FUNCTIONING SEZ LANDS IN THEIR NATURAL CONDITION AND RESTORE 25 PERCENT OF THE SEZ LANDS THAT HAVE BEEN IDENTIFIED AS DISTURBED, DEVELOPED OR SUBDIVIDED, TO ATTAIN A 5 PERCENT TOTAL INCREASE IN THE AREA OF NATURALLY FUNCTIONING SEZ LANDS.

a. Basis for The Threshold

Protection and restoration of SEZs is one of the most cost-effective mechanisms for nutrient and sediment load reduction available in the Tahoe Basin. The quantity of nutrients and sediment removed in SEZs is greatly affected by even slight disturbance of these areas.

SEZs effectively remove nutrients and sediment from tributary flows. Movement of surface runoff as sheet flow through these areas allows larger sediment materials to settle out while vegetation filters out smaller suspended material. Nutrients are stripped out and support vegetative growth. A portion of the nutrients absorbed by plants is released to the atmosphere as gaseous products of organic decay, and some of the nutrients absorbed by plants later are bound up in the soil and buried by additional sediment. Thus, vegetation in SEZs reduces the amount of nutrients that would otherwise be transported to Lake Tahoe. Placement of fill material, structures, or any other encroachment by development limits the capacity of SEZs to convey surface and underground flows, and eliminates their treatment and filtration capacity.

Development in SEZs also creates erosion problems by concentrating surface runoff, increasing channel and streambank erosion, and by disturbing areas subject to periodic inundation by surface runoff.

b. Attainment of the Threshold

To meet the thresholds, the acreage of SEZs must be evaluated. This is presently dependent on the current TRPA maps. TRPA has acknowledged the need for better maps, and has made a commitment to prepare such maps, discussed below.

Until better mapping is developed, TRPA will continue to use the existing maps to guide the SEZ restoration program. Recent estimates show that there are about 17,700 acres of SEZ in the Lake Tahoe Basin. Approximately 7,500 acres are on National Forest land and 9,200 acres on private land. For the entire Lake Tahoe Basin, the 17,700 acres of SEZ represents about 8 percent of the total land area (205,250 acres). However, the 9,200 acres of SEZ on private land represents 18 percent of the land area in private ownership (50,000 acres), whereas the 7,500 acres of SEZ on National Forest land represents 5 percent of the National Forest land (142,300 acres). The Forest Service has estimated that in the entire Lake Tahoe Basin, 60 to 70 percent of historical SEZ land has been lost due to past development. There are approximately 200 acres of SEZ planned for restoration work on National Forest land in the rural portions of the Tahoe Region; this does not include restoration on subdivided parcels acquired by the Forest Service through the Burton-Santini program. The bulk of the disturbed SEZs are on private lands. Thus, the emphasis of the TRPA thresholds and the Water Quality Management Plan (208) is to protect and restore SEZs, especially on private lands because these SEZs have the greatest significance in relationship to water quality management due to their proximity to Lake Tahoe. These lands are valued for the natural sediment filtering and nutrient recycling they perform on surface runoff before it enters Lake Tahoe.

TRPA's threshold calls for the protection and restoration of 25 percent of the SEZ lands that have been disturbed, developed, or subdivided. There are 4,400 acres of SEZ lands which have been disturbed, developed, or subdivided. This represents about 50 percent of the SEZ lands in private ownership (9,200 acres). The level of disturbance ranges from moderate, where streets are in place but most lots are vacant, to severe, where the physical characteristics of the SEZ have been destroyed and its benefit as a conveyance and treatment system lost. Of the 4,400 acres, 2,500 acres have been developed, disturbed and/or built on, and 1,900 acres have been subdivided, but not built on. Much of the 1,900 acres are critical elements of the natural surface water treatment and conveyance systems.

The various land acquisition programs in the Lake Tahoe Basin have been acquiring environmentally sensitive land, especially SEZs. Based on a sample of the 1,865 parcels which the California Tahoe Conservancy had acquired through May 1988, approximately 36 percent were partially or totally SEZ. These SEZ lands account

for about 400 acres. This does not include the 200 acres of SEZ recently acquired by purchasing the Cove East property, part of the Truckee Marsh. The Forest Service, through the Santini-Burton land acquisition program, had acquired 2,265 parcels through March 1988. The SEZ lands acquired by the Forest Service account for about 300 acres of SEZ. The total SEZ land acquired by both acquisition programs is approximately 900 acres. Nevada's Commission on Land Acquisition in the Tahoe Basin had not yet acquired any acreage as of August 1988, but SEZ parcels will be the top priority.

In terms of actual SEZ restoration work, the threshold calls for restoration of 25% of the 4,400 acres of SEZ lands which have been disturbed, developed, or subdivided. This sets a target of 1,100 acres of SEZ restoration work.

There are 48 restoration projects described in this volume. These projects cover approximately 450 acres of SEZ. The break-out by county is as follows:

County	Projects	Acreage
Placer	9	88
Washoe	10	82
Douglas	9	80
El Dorado	20	202
	48	452 acres

There are a number of SEZ restoration projects which have been completed in the urbanized portion of the Region. The following includes some of the more recent projects:

Project	Acreage
Sawmill Pond	20
Griff Creek	2
Tahoma	7
Country Club	1
Wildwood/Keller	30
Kingsbury Meadows	5
	65 acres

There are also a number of proposed projects which will result in large acreages of SEZ restoration in and around the urban areas. For example, restoration of the Cove East property, 200 acres of the Truckee Marsh, will result in 36 acres of actual SEZ restoration work. The Cooperative Resource Management Plan along the Upper Truckee River will result in over 20 acres of restoration work. Of the 700 acres of SEZ already acquired by the California Tahoe Conservancy and the Forest Service, about 50% will be

actively restored according to staff of the respective agencies. The restoration work includes bank stabilization, closing roads with fences and barriers, and revegetating roads and meadows. About 350 acres of SEZ will be restored over the next 15 years by these small projects. Acquisition of SEZ parcels by Nevada State Lands and additional acquisitions by the CTC and USFS will increase the total area of small projects to about 600 acres. In order to see if the target of 1,100 acres is feasible, the following summarizes the program's accomplishments and projections:

	Acres
Completed projects	65
TRPA SEZ Restoration Projects (Vol. III)	452
Large projects (Cove East)	36
Small Projects (CTC, USFS, NV St. Lands)	600
	1,153

The 1,153 acre projection meets the target of 1,100 acres called for by the threshold standard. It is important to note that these projections are based on the current SEZ definitions and criteria. Although a recent study of parcels containing SEZs has indicated no significant difference in the actual acreage of SEZ under both criteria, TRPA staff will verify the actual acres of restoration under both criteria as proposed projects are completed over the next five years. Also, as SEZs are remapped, new potential projects will be added to Volume III as the mapping detail progresses. The threshold will be attained and maintained, especially as new projects are developed over the next 15 years.

In terms of the threshold calling for the preservation and restoration of all naturally-functioning SEZs in undeveloped, unsubdivided lands, the Lake Tahoe Basin Management Unit of the Forest Service has identified 200 acres of SEZ still needing restoration after 1987 on National Forest land. Since 1984, the Forest Service has rehabilitated the following acreages:

Year	Acreage
1984	130
1985	230
1986	120
1987	200
	680 acres

SEZ restoration is the top priority of the Forest Service program and the target of 200 acres is attainable, possibly within the next two years at the present rate of restoration.

2. GOALS AND POLICIES

SEZs are a subelement of the Conservation Element in the Goals and Policies (1986). The protection and restoration of SEZs are essential in order to achieve the environmental thresholds for water quality, vegetation preservation, and soil conservation. The goal for the preservation and restoration of SEZs is to provide for the long-term preservation and restoration of stream environment zones.

The policy to promote the restoration of SEZs is to restore all disturbed SEZ lands in undeveloped, unsubdivided lands, and restore 25 percent of the SEZ lands that have been disturbed, developed, or subdivided.

3. PLAN AREA STATEMENTS

The Lake Tahoe Region is divided into more than 175 separate Plan Areas. For each Plan Area (TRPA, 1987b), a statement has been adopted as to how that particular area should be regulated to achieve environmental and land use objectives. For a particular Plan Area, information on SEZs and SEZ restoration is given if applicable.

The SEZ information is found in three sections of the Plan Area Statement (PAS):

1. Description - Existing Environment,
2. Planning Considerations, and
3. Special Policies.

For example, in the Existing Environment Section, the percent of the area in SEZ is given. In the Planning Considerations section, current problems are identified, such as, "severe flooding and erosion problems associated with development within SEZs and channelization of natural drainages" (PAS 014), and finally, in the Special Policies section specific recommendations are made. For example, in PAS 091, the "SEZs in this area shall be evaluated as soon as possible and designated for restoration or reclassification."

4. CODE OF ORDINANCES

In Chapter 18 of the Code (TRPA, 1987a), SEZ restoration is listed in the Table of Primary Uses in Section 18.3 and defined as the reestablishment of the natural functions of areas that prior to modification were directly influenced by the presence of surface water or near surface groundwater and which have been identified by TRPA as an SEZ. Reestablishment includes activities such as the removal of fill material or other encroachments, recontouring or revegetation. The implication of this policy in terms of SEZ restoration is that the PAS must be referred to in order to

determine if the use is allowed or special. For example, in PA 100 - Truckee March, SEZ projects are a special use whereas in PA 101 - Bijou Meadow, SEZ projects are an allowed use. To approve an SEZ restoration project as a special use, a public hearing must be held, certain findings must be made, and the project must obtain Governing Board approval.

B. PROGRAM DEVELOPMENT

The procedures used in the development of the SEZ Restoration Program include the identification of SEZs; mapping of SEZs; identification of SEZs in disturbed, developed, or subdivided areas; field verification, and analysis of restoration potential.

SEZs were identified by the criteria in the Handbook of Best Practices (TRPA, 1978). The SEZs were then overlayed onto TRPA (1:400 scale) land use maps. Areas with SEZs were then identified in the developed and subdivided areas on the land use maps. Project sites were identified and categorized by county and watershed. Field surveys were conducted to determine the existing condition of SEZs, the potential for SEZ restoration, and the possibility for incorporating CIP and BMP programs at the project sites. Acreages were estimated for the project sites based on:

1. actual restoration, such as removal of fill and revegetation, in the SEZs;
2. extent of CIP and BMP incorporation at the project sites; and
3. extent of beneficial downstream effects.

The project descriptions which follow in Chapter VIII are a result of the above process. The mapping and identification of potential SEZ restoration projects was initiated in 1984. Since that time, new insight and more scientific information on SEZ research and applications have become available. Because of the rapidly changing technology, TRPA has made a commitment to update and refine the SEZ Restoration Program.

To refine the SEZ Restoration Program and keep it current and functioning, TRPA will take the following steps:

1. classification and mapping of stream reaches according to their stability classification;
2. matching restoration methods and disturbed reaches based on their stability classification;
3. identification of major problem areas and project sites for use in the community planning process, public works planning, and other programs;
4. development of guidelines for planning and designing SEZ restoration projects;

5. integration of SEZ mapping for purposes of identification, restoration, and flood hazard determination; and
6. establishment of a scientific and technical advisory committee to guide the SEZ restoration program.

To accomplish the process indicated above, TRPA has initiated action on steps 1, 5 and 6. TRPA is obligated to classify and remap the SEZ/flood plain areas of the Region because the current SEZ maps will be inadequate since the criteria will change and the current Army Corps of Engineers flood plain maps of the Basin do not include all necessary streams.

The proposed mapping project has a total cost of $180,000 over FYs 89-90 and 90-91. TRPA has requested funding from Nevada and California to enable the Agency to undertake a two year project supervised by TRPA water quality staff and cover the additional personnel (crew of two hydrologists for two seasons), color and infrared aerial photographs, field equipment, and vehicle expenses.

The proposed program is crucial to the interests of both California and Nevada because of the recent emphasis on improved flood plain and SEZ mapping to ensure proper stewardship of the vast public expenditures being made for capital improvements (erosion control projects) and land acquisition in the Tahoe Region. In addition, the proposed program is called for in comments submitted by the following agencies regarding the 1988 draft 208 plan:

-- Nevada Division of Environmental Protection
-- California Department of Justice - Attorney General
-- California Regional Water Quality Control Board - Lahontan Region
-- California State Water Resources Control Board
-- League of Women Voters of California
-- League to Save Lake Tahoe

Attainment of the environmental threshold calling for restoration of a portion of the disturbed stream zones depends on proper mapping of those area. Community plans, redevelopment plans, master plans, recreation plans, and resource management activities would all benefit from improved mapping, as would priorities for SEZ restoration and erosion control projects. With proper identification of SEZs and flood plains, better planning could be done to provide the protection and restoration these resources deserve. Doing the work piecemeal as projects are designed is not cost effective and can result in lack of consistency and inequities to project proponents.

In terms of step 6, TRPA has already started the organization and recruitment of the technical members for the advisory committee. Steps 2, 3, and 4 will be accomplished as the mapping detail nears completion. During FY 88-89, the advisory committee will be established (by January 1, 1989) and meet at least four times a year. The requested funding for the SEZ mapping (steps 1 and 5) is for FYs 89-91. The mapping field work will be initiated on July 1, 1989 and continue for two years. The SEZ restoration program (Volume III) will be updated by the end of FY 89-90. Minor changes, additions, or corrections will be made based on the information gathered during the first field season. TRPA staff and the advisory committee will start the development of guidelines for planning (step 4) and identification of major problem areas (step 3) during FY 89-90 and continue through FY 90-91. A major revision of Volume III will be completed by June 30, 1991. This revision will include revised SEZ maps, updated guidelines, and new SEZ projects.

C. GUIDANCE ON PROJECT PRIORITIES AND RESTORATION METHODS

Under the Goals and Policies (TRPA, 1986) it is the policy of the TRPA that local governments and other implementing agencies require flexibility in project priorities to match funding sources with specific projects. TRPA will establish priorities, in consultation with the implementing entities, so as to direct revenues to high priority projects.

The highest priorities for SEZ restoration should be projects in the watersheds with the highest ability to deliver nutrients and sediments to receiving waters within each jurisdiction.

TRPA has selected the watershed condition classification developed by the IPES Technical Committee for use in the initial SEZ restoration priority system. The IPES Committee consisted of experts in the fields of soil science, hydrology, engineering, and planning. (Volume I, Attachment 3, Members, IPES Technical Committee).

As documented in the Technical Appendix, Volume VII, the committee evaluated a watershed's ability to deliver nutrients and sediments using the following three criteria:

1. The geomorphic, precipitation, and streamflow characteristics of each watershed.

2. The streamflow water quality characteristics expressed as nutrient and sediment loading per unit area of watershed. Nitrate-nitrogen, dissolved organic nitrogen, dissolved orthophosphate, and suspended sediment data were used.

3. The existing land coverage compared to desirable land coverage.

Each of 64 major watersheds was evaluated and given a numerical rating ranging from zero to 70. TRPA used this rating to place each watershed into one of three categories which reflect a watershed's relative ability to deliver nutrients and sediments to receiving waters (Volume VIII, Technical Appendix).

TRPA used the watershed ratings to assign each SEZ restoration project in Chapter VIII a priority category (high, medium, or low). Where necessary, TRPA used the following six criteria to adjust the priorities of certain projects to account for conditions specific to a given area:

1. The percentage of SEZ land in the PA.
2. The percentage of high hazard land in the PA.
3. The proximity to a tributary.
4. The proximity to Lake Tahoe.
5. The presence or absence of a direct hydrological connection to either a tributary or Lake Tahoe.
6. The type of SEZ in each PA, i.e., tributary, meadow, alluvial soils, high groundwater table.

TRPA will continue to assign new projects to the three priority groups as they are developed.

This process addresses nutrient and sediment loading to Lake Tahoe and in-stream water quality problems, and contributes to an equitable, cost-effective application of available revenues around the Region. This process directs projects to those watersheds most in need of treatment and provides a cost-effective means of controlling water quality problems in the Tahoe Region.

TRPA believes a priority system should address sediment and nutrient delivery. Different programs of other agencies, including the California Tahoe Conservancy, the Forest Service, the Nevada Commission on Land Acquisition in the Tahoe Basin, and units of local government which incorporate this consideration to varying degrees, as well as other implementation considerations, can coexist in the short term and be more fully integrated in the long term. The goal is full program implementation, which can only be accomplished through effective inter-agency communications, cooperation, and flexibility. TRPA will work with the various implementing agencies to incorporate the 208 priority concept into their long range programs, and track and evaluate progress at regular intervals.

Historically, SEZ restoration methods have included those practices used to balance the effect of disturbance, encroachment, or development of SEZs. A common practice in the past development of the Tahoe Region was to fill SEZs for urban development. Whenever an SEZ is filled, the dynamic balance between discharge, sediment and nutrient concentration, and channel morphology is upset. The fill reduces the SEZ capacity and creates an unfavorable condition of water flows which can result in flooding. Thus, the restoration method usually recommended is the removal of the fill material and construction of a sediment basin or pond with revegetation.

Although the removal of fill material may be part of the restoration effect, the entire drainage network must be evaluated. Any change in one portion of a stream channel usually produces a change elsewhere. Since it is a dynamic system, the restoration method must be matched to the stability of the stream reach involved. In addition to maintaining adequate capacity in SEZs to pass frequent flows without flooding, restoration methods should provide for nutrient uptake as well. Most of the disturbed SEZs were natural meadows or marshes where vegetation filtered out sediment and nutrients. SEZ restoration methods should incorporate the biological advantages of vegetation wherever possible.

D. FUNDING

To provide financial resources for implementation of the SEZ restoration program, the Code (Chapter 82.6) specifies that at least five percent of the water quality mitigation funds collected for each local jurisdiction shall be used for SEZ restoration projects included in the program (TRPA, 1987). The USDA Forest Service, the California Tahoe Conservancy, and Nevada's Commission on Land Acquisition in the Tahoe Basin also have the ability to fund SEZ restoration projects.

E. COSTS

The costs of SEZ restoration projects, where known, are included in the project descriptions in Chapter VIII. Future updates will include additional information on costs and sources of revenue.

VII. REFERENCES

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VIII. SEZ RESTORATION PROJECT DESCRIPTIONS

This chapter contains the descriptions by county of the initial SEZ restoration projects identified beginning in 1984. Some of the proposed projects have been completed and this information can be found under the "Update" section. The descriptions which follow do not represent all of the potential projects. TRPA has committed to remap, inventory, evaluate, and describe other projects in the future. TRPA seeks the advice and help from the various Basin agencies in identifying potential projects. Also, the establishment of a scientific and technical advisory committee will help provide guidance to the program.

The order of projects is simply by the Plan Area number. Many of the initial projects described are generally located near the outlet of the watershed, that is, fairly close to Lake Tahoe, and usually within the developed urban areas. This is consistent with the objectives of the TRPA SEZ restoration program. One may argue that the restoration work should begin at the source of the problem. TRPA agrees with this statement and relies on the extensive work being conducted by the Forest Service in the upper reaches of the watersheds on Federal Land. The majority of problems, however, occur in the subdivided and developed areas. These are problem areas because the street network has increased the drainage density. The increased developed drainage density has the following effects:

increased surface runoff,
shorter travel time,
increased velocities,
faster time of concentration,
lower potential infiltration, and
lower potential evapotranspiration.

In short, the developed areas with their road networks tend to short-circuit the natural system. The intent of the SEZ restoration program is to offset the short-circuit factors, especially those located in SEZs.

As the remapping of SEZs takes place, projects will be assigned a priority based on the watershed's relative ability to deliver nutrients and sediments to receiving waters (Section C, Chapter VII). Once stream reaches are mapped and classified in terms of stability and disturbance, restoration methods can be recommended. The proposed mapping will represent an integrated effort in terms of evaluating the entire stream channel. This holistic approach will allow better project planning and design and thus help to identify major problem areas and assign the proper priorities to SEZ restoration projects.

The direction of the SEZ restoration program is intended to develop a program of action, not just a listing of potential projects. By evaluating the form and function of entire stream channel network, restoration guidelines will be developed to refine the SEZ restoration program and take it far beyond simple drainage control projects.

The project descriptions which follow generally observe the following format:

Project Name: The project name used to identify a project description may be the stream or meadow, the subdivision or street, or the proper name of the project location.

Project Number: The project number used to identify a project description is the Plan Area Statement (PAS) number. If more than one project is located in a Plan Area, then a letter is used after the PA number to identify the specific project location.

TRPA Map Number: The number of the TRPA (1:400 scale) land use map where the project is located.

Watershed Name (Number): The name and number of the watershed where the project is located according to the USGS Atlas HA-587 (1978).

Priority Category: High, medium, or low category based on criteria in Chapter VI.

Project Location: The physical location of the project is described using streets, subdivision, county, and state. Soil type and land capability district are given.

Site Description/Field Verification: The project site is described based on field verification. The existing problems are identified.

Restoration Potential: The feasibility of the project is described. Also, how the project may fit in the CIP and BMP programs.

Implementation: The measures which may be necessary in order to implement the project are described.

Update: A yearly update will be added in this section as projects are completed or out to bid.

SEZ Acreage Restored: The number of SEZ acres restored will be recorded and tracked in order to meet the numerical standard required by the Threshold Study (TRPA, 1982). The cost of the completed SEZ restoration project will be given.

As new projects are identified, the project descriptions will be added to the SEZ volume using the above format.

VIII. SEZ RESTORATION PROJECT DESCRIPTIONS

A. Placer County, California

1. PA 001A, 002: Grove Street Tract
2. PA 002: Tahoe Lake School
3. PA 005: Burton Creek Meadow
4. PA 006: Sierra Pacific Yard
5. PA 024B: Snow Creek
6. PA 158S: Quail Creek
7. PA 158N: Homewood Canyon Creek
8. PA 159: Grand View Avenue
9. PA 166, 167: Ward Creek

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Grove Street Tract, Tahoe City

PROJECT NUMBER: PA 001A, 002

TRPA MAP: C-7

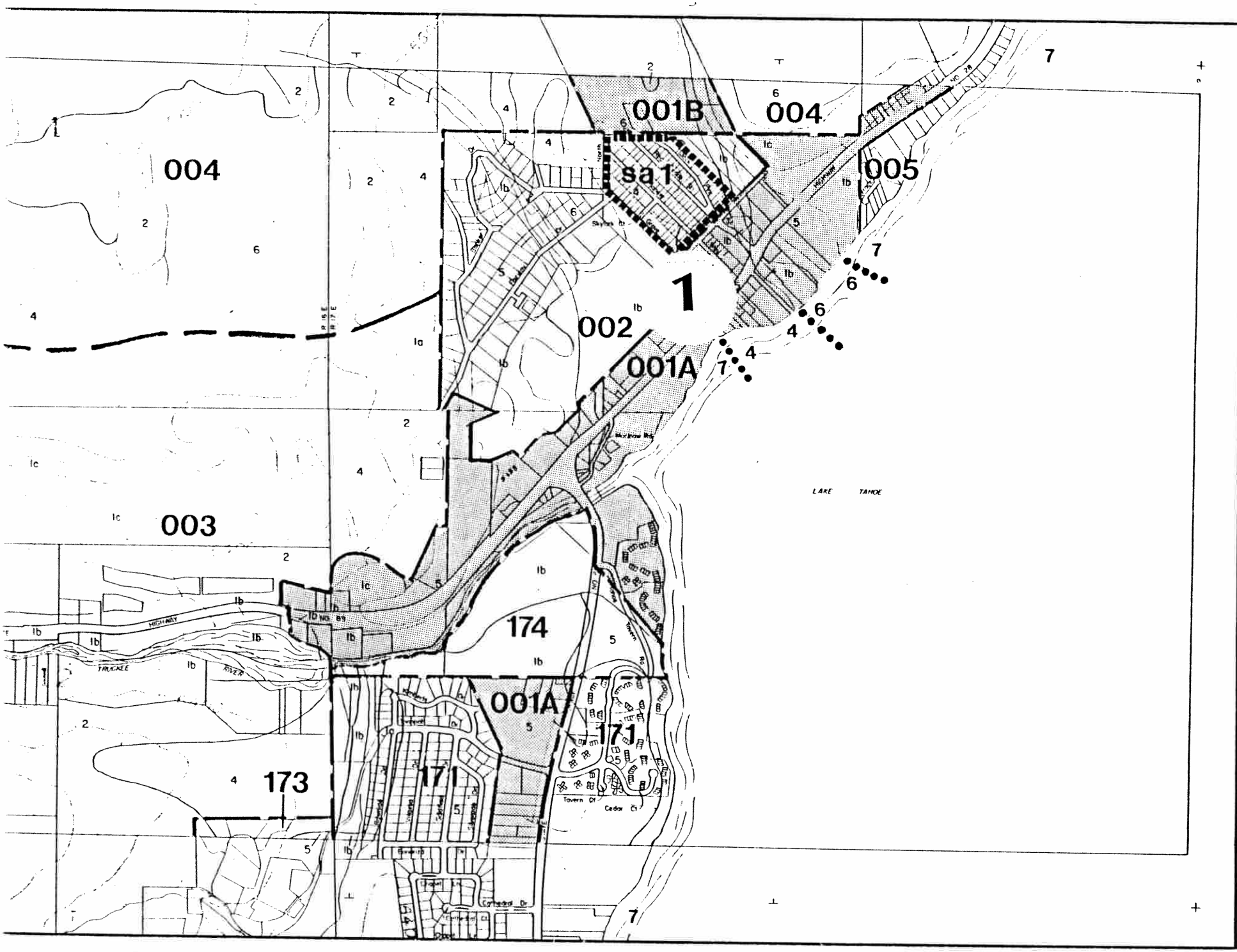
WATERSHED NAME (NUMBER): Intervening Area Between Truckee River and Burton Creek (3)

PRIORITY CATEGORY: Low

PROJECT LOCATION: The project site is located between the Truckee River and Burton Creek watersheds in Tahoe City, Placer County. The tract lies between Highway 28 and North Street and the major streets include Grove Street, Pioneer Way, Red Cedar Street and jack Pine Street. The soil types are FuD (5), JwE (4) and JtD (6). Riparian vegetation is dominant throughout the area.

SITE DESCRIPTION/FIELD ANALYSIS: The project site encompasses approximately 5 acres of excessive impervious coverage (homes, roads, etc.). The tract is comprised of high density single family homes with small yards. Driveways are generally unpaved with inadequate or no roadside or storm drainage. There are no capital improvements on the properties. Several streets are very steep increasing the need for proper drainage facilities.

RESTORATION POTENTIAL: Roadside drainage and storm drainage facilities should be installed in the project area. In conjunction, it will be necessary to enforce proper BMP's, especially paved driveways to achieve effective stormwater runoff control.



LAKE TAHOE REGION
TAHOE CITY
PLACER COUNTY, CALIFORNIA

KEY MAP

C-7

548-D-520

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Tahoe Lake School and Tahoe City Golf Course - Intervening Area.

PROJECT NUMBER: PA: 002

TRPA MAP: C-7

WATERSHED NAME (NUMBER): Intervening Area Between Truckee River and Burton Creek (3)

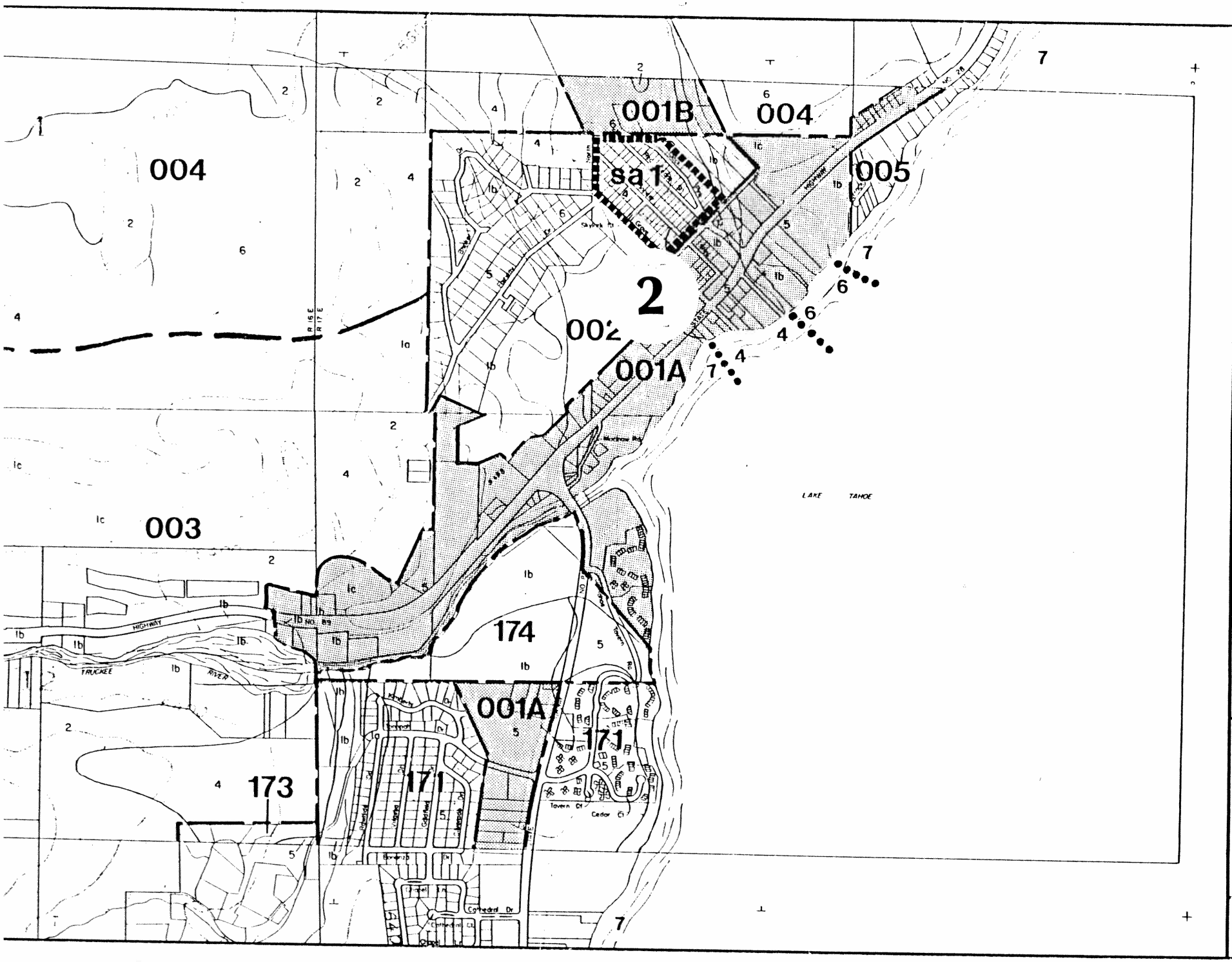
PRIORITY CATEGORY: Medium

PROJECT LOCATION: Intervening area of Truckee River, south-west of Burton Creek in Tahoe City. The site lies between Grove Street (Tahoe Lake School) and Tahoe City Golf Course, Soil type is Gr, with 90% of the area classified as SEZ.

SITE DESCRIPTION: The project site of approximately 5 acres is characterized by a small area of fill material to accommodate the school play yard and extensive lawn encroachment on the golf course side of the site. The stream itself appears to be in good condition.

FIELD ANALYSIS: The meadow area near the school is subject to seeps and channelization. Underground drainage facilities allow for diversion of the high water table and interfere with the function of the meadow. Invader species of plants have entered the disturbed fill area. There are no storm drainage measures on the site to control storm runoff and the erosional forces of peak flow periods. The meadow area nearest the golf course is subjected to unknown amounts of fertilizers to maintain the non-native grass species.

RESTORATION POTENTIAL: The school yard area can be restored adequately with minimal effort while retaining its intended use as a play area. The restoration direction for this portion of the site is installation of adequate BMP's and adequate storm drainage to protect the SEZ from excessive sediment loading. Restoration potential for the golf course portion of the meadow is minimal. Regulation of amount and content of fertilizers and proper drainage of irrigation water from the course can help reduce the overburden on the SEZ and restore it to a more naturally functioning state.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RIVER
Tavern Ct
Cedar Ct
Cathedral Dr
LAKE TAHOE REGION
TAHOE CITY
PLACER COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY
KEY MAP
C-7
548 D 520

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Burton Creek Meadow West of Star Harbor

PROJECT NUMBER: PA 005

TRPA MAP: C-6

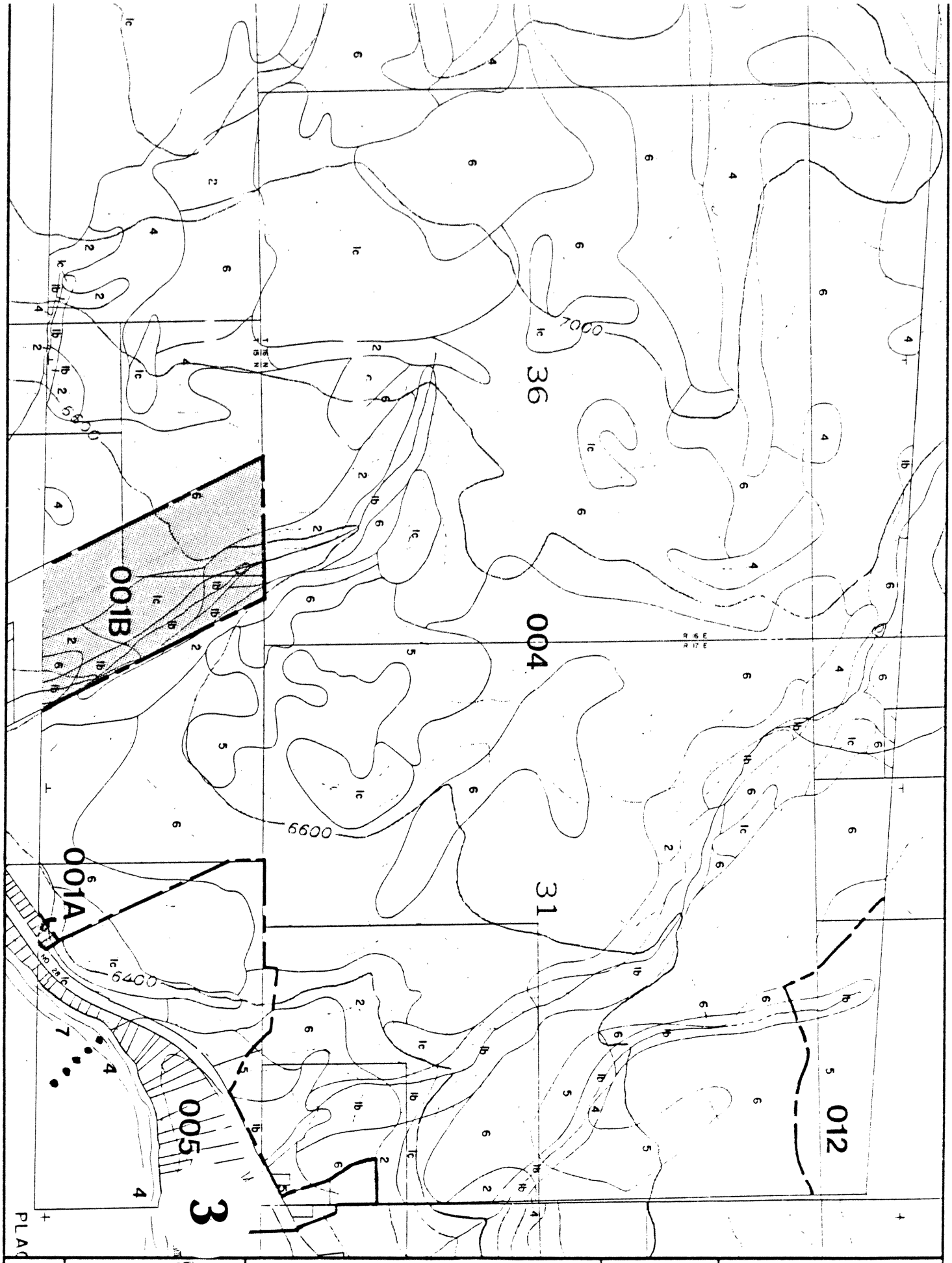
WATERSHED NAME (NUMBER): Burton Creek (4)

PRIORITY CATEGORY: Low

PROJECT LOCATION: The Project site, encompassing approximately 13 acres is located immediately west of the Star Harbor Condominium complex in Placer County. Affected parcels include 94-140-09, 11, 12, 20, 29, 32, 33, 34 and 36. Land capability 1b with Mh soil type.

SITE DESCRIPTION/FIELD ANALYSIS: The project site is characterized by a large wet meadow. It is utilized for seasonal horse facilities. Compaction and loss of vegetation have resulted from grazing and the use of corrals and feeder pens. The horse facilities are an accessory use to several Lakefront homes across the meadow. This use is seasonal and in some years the meadow is not grazed at all. Additional impacts on the meadow occur from the crossing near Star Harbor Condominium parking lot. This crossing is very stable and is located and designed to minimize encroachment into the streamzone. It provides access to the several homes across the meadow. It appears that the natural channel has been diverted to provide flood irrigation to the meadow. The meadow is in relatively good condition aside from the seasonal horse facilities.

RESTORATION POTENTIAL: This is a highly visible area from the highway. The corrals and horse stables should be removed and compacted areas revegetated with meadow grasses. The remedial erosion control ordinance may be applicable to restore this project site. The single family dwelling units near the Lake would not be affected. Roadside drainage on the Star Harbor access road is needed and restoration and revegetation of the horse corral facilities.



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KEY MAP

LAKE TAHOE REGION
BURTON CREEK
PLACER COUNTY, CALIFORNIA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S.E.H.
DATE: October 1971

REVISION NO.	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Sierra Pacific Landscaping Industrial Yard

PROJECT NUMBER: PA 004

TRPA MAP: C-6

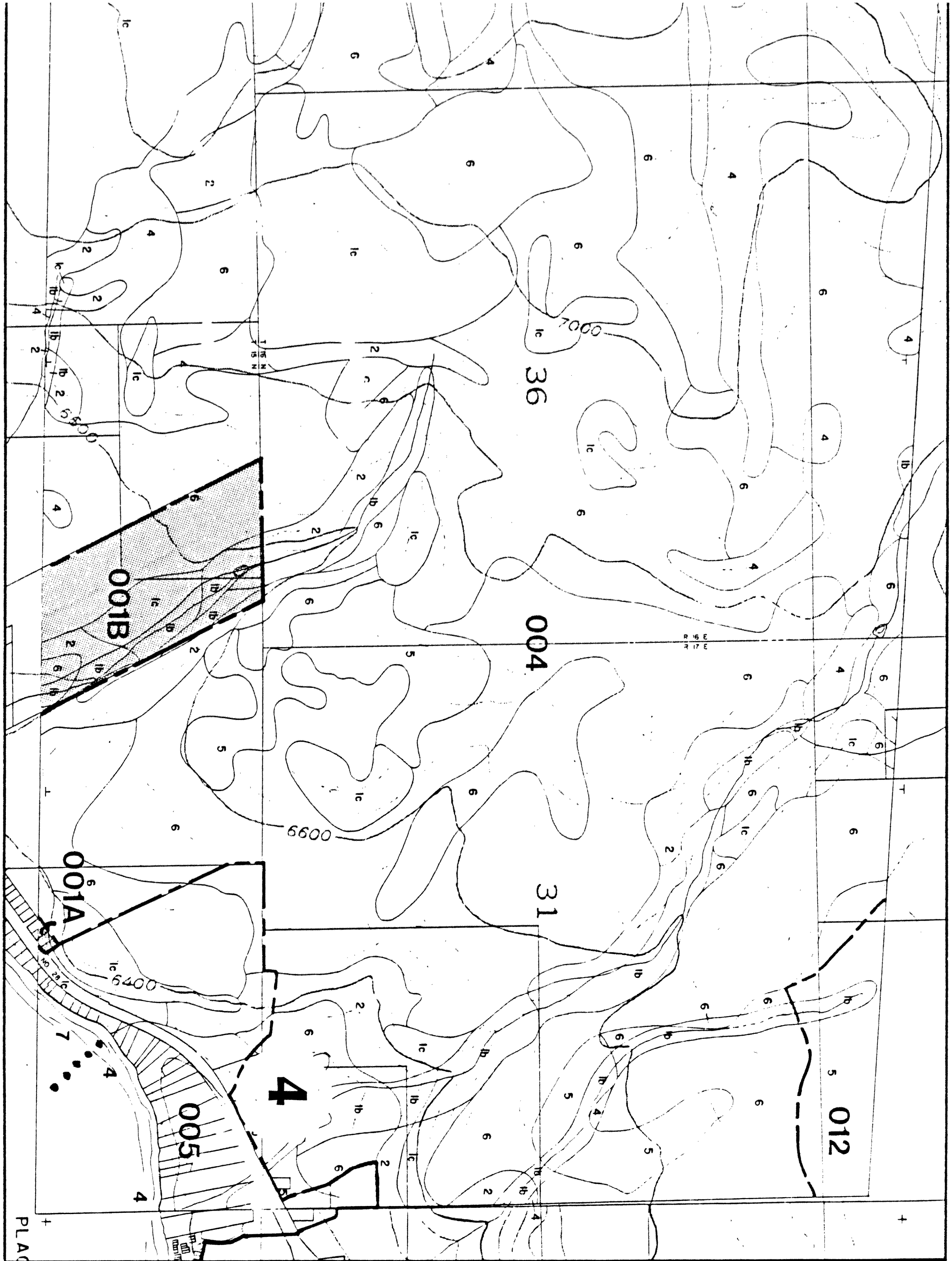
WATERSHED NAME (NUMBER): Burton Creek (4)

PRIORITY CATEGORY: Low

PROJECT LOCATION: The project site of approximately 5 acres is located just outside of Tahoe City north of Highway 28 (North Lake Boulevard) on Burton Creek and is accessed by an unpaved road immediately west of Rocky Ridge Road. The soil types are JhC (6) and Mh (1b), with a SEZ classification.

FIELD ANALYSIS: The project site consists of fill material deposited in the meadow to accommodate a parking pad for boat trailers, heavy equipment and construction and paving debris. The fill area is highly compacted to accommodate heavy equipment storage. Toxic leakage from equipment (grease, oil, gas) may be entering the creek. Channelization has occurred on the site due to placement of the fill material.

RESTORATION POTENTIAL: The project site is visible from the highway and has good restoration potential. The fill material should be removed, and the area recontoured and revegetated with native species. Roadside drainage at the landscape yard road is necessary as well as storm drainage in the vicinity.



C-6 556.D.570	KEY MAP	LAKE TAHOE REGION **BURTON CREEK** PLACER COUNTY, CALIFORNIA TAHOE REGIONAL PLANNING AGENCY	SCALE: 1" = 400' CHECKED BY: S.E.H. DATE: October 1971

DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Snow Creek Fork at Highway 28

PROJECT NUMBER: PA 024B

TRPA MAP: E-4

WATERSHED NAME (NUMBER): Snow Creek (20)

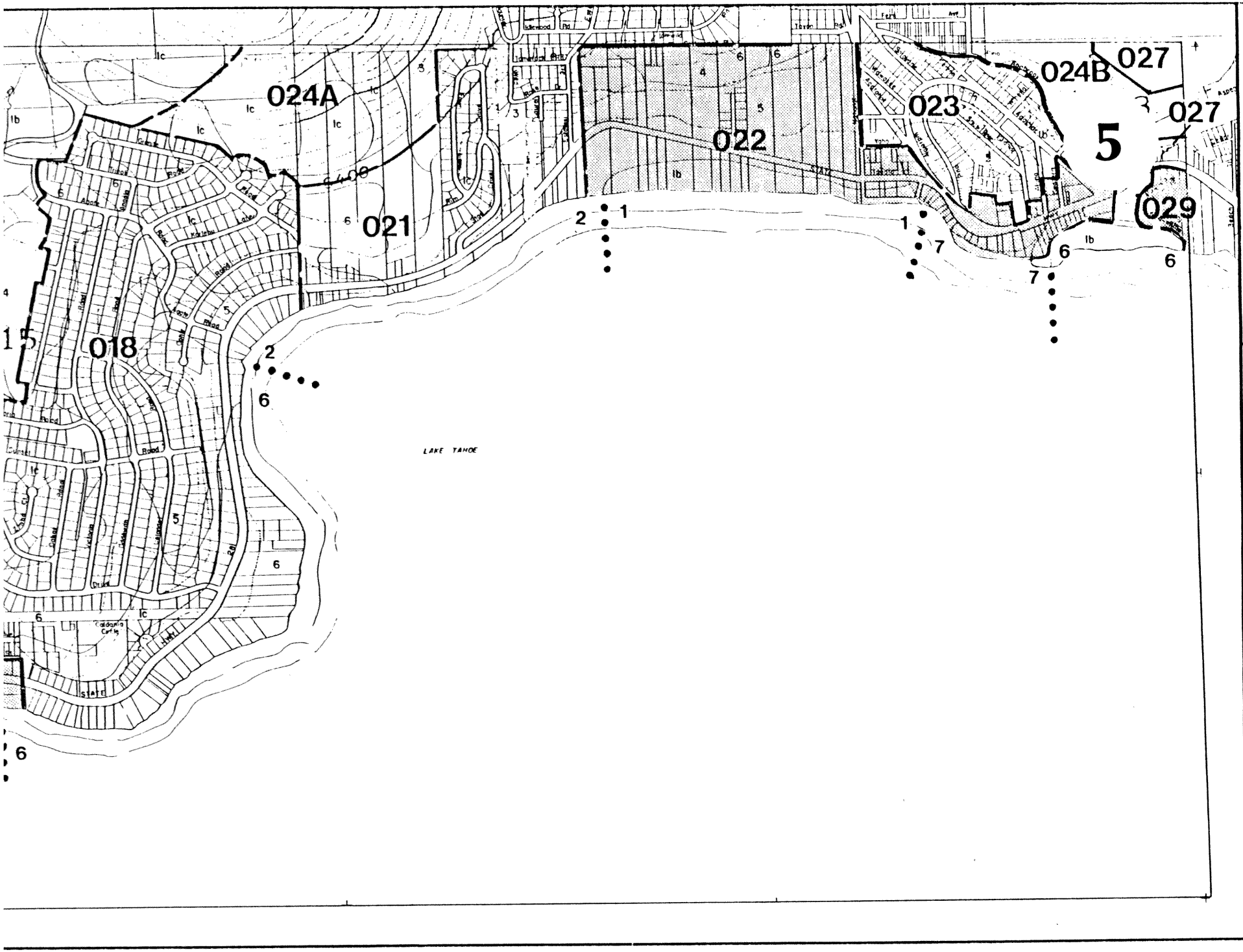
PRIORITY CATEGORY: High

PROJECT LOCATION: The project site is located adjacent to Highway 28 and the Wood Vista Golf Course, Tahoe Vista, Placer County. Approximate size of the project area is 25 acres. Affected parcels include 89-181-16, 17, 20, 22, and 89-110-03, 05. Land capability classification is 1b with Mh soil.

SITE DESCRIPTION/FIELD ANALYSIS: The project area consists of a filled meadow. Prior to deposition of the fill the area contained riparian vegetation and was inundated during period of peak runoff. The fill area is approximately 2.5 acres in size and contains approximately 9,500 cubic yards of earthen material. Due to deposition of the fill material, Snow Creek has undergone several changes including reduced water quality treatment capacity, channelized flow patterns and increased localized flooding.

RESTORATION POTENTIAL: The Snow Creek restoration project is currently being designed by Placer County. The removal of the fill material, establishment of a widened flood plain and revegetation with riparian species would be undertaken. The proposed project would reduce localized flooding and significantly increase the meadow's water quality treatment capacity.

COST: Based on estimates by Placer County, this streamzone restoration project will cost approximately $250,000. This includes excavation costs, trucking the material to a designated disposal site, and revegetation of the area.



LAKE TAHOE REGION
TAHOE VISTA
PLACER COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY

E-4

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Meadow and Lagoon Street in Quail Creek Watershed

PROJECT NUMBER: PA 158S

TRPA MAP: C-11

WATERSHED NAME (NUMBER): Quail Creek (98)

PRIORITY CATEGORY: High

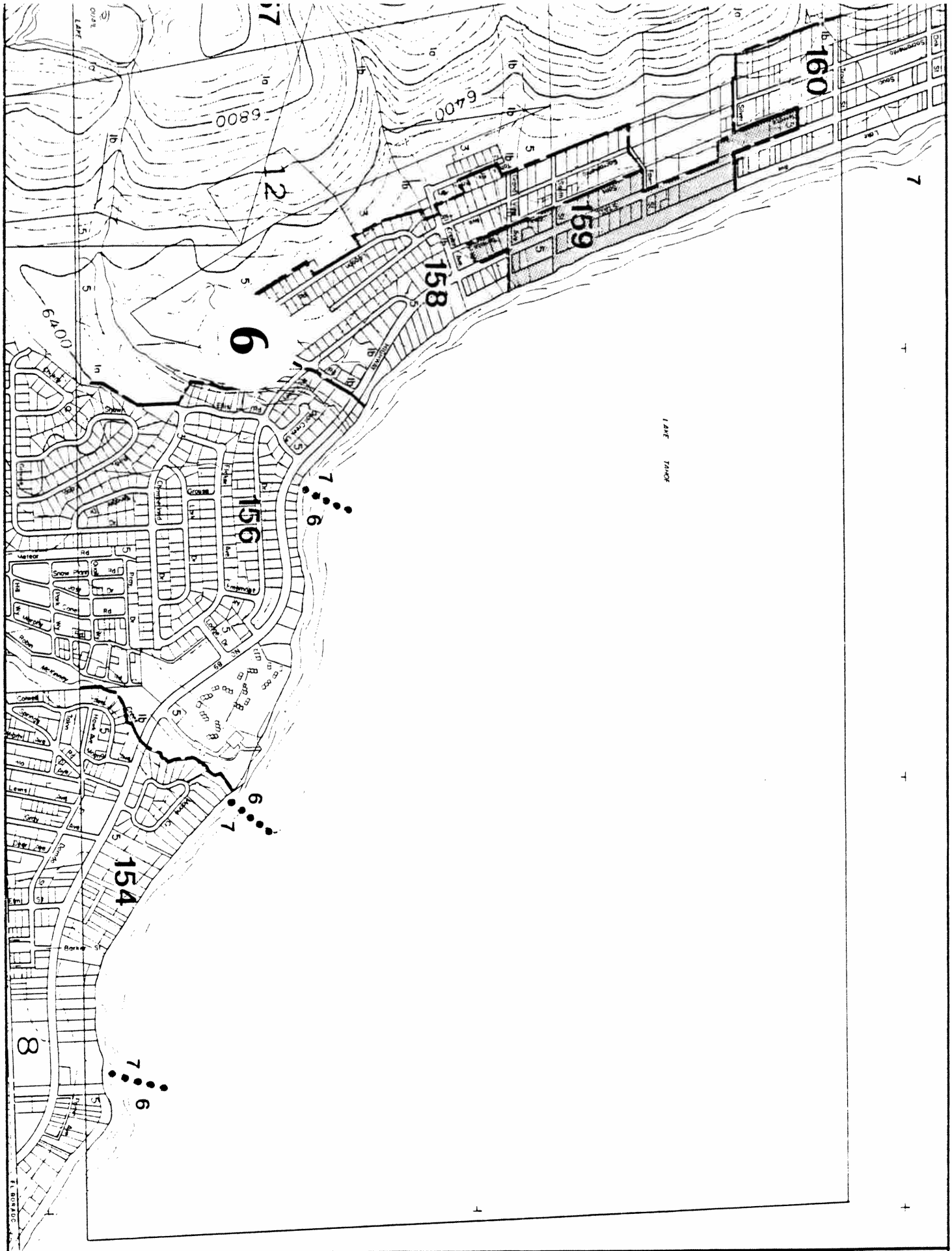
PROJECT LOCATION: The project site of approximately 15 acres is located west of McKinney Drive off Meadow Road in the McKinney Shores Subdivision, Placer County. Affected parcels include 97-050-07, 27, 97-200-14, 15, and 98-023-01, 02. Land capability classification 1b with GR soil type.

SITE DESCRIPTION/FIELD ANALYSIS: The project site is characterized by a channelized flood plain and a high groundwater table. Vegetation consists of willows and meadow grasses. A paved road exists (Meadow Drive) and an unpaved parking area used as a community earth dumping ground exists in the stream environment zone. Considerable downstream bank erosion has resulted from upstream modifications. Flood plain channelization has resulted from dumping of earthen fill material. The unnecessary portion of Meadow Road could be removed allowing access to improved parcels 97-200-12, 13 via Lagoon Road and parcels 97-200-14, 98-023-01 via McKinney Road.

RESTORATION POTENTIAL: The unnecessary portion of Meadow Road should be removed with county approval, fill material should be removed, and the flood plain should be restored. Extensive earth work using heavy equipment will be necessary. The entire area should be revegetated with riparian species. The entire project site can be restored to a functioning stream environment zone by removing the earth fill in the flood plain. Storm drainage and adequate road-side drainage are needed in the project area.

IMPLEMENTATION: County approval will be necessary for removal of the road. TDR, lot retirement, and open space easements are possibilities for affected vacant properties.

UPDATE: A restoration project has been scheduled for 1988. The fill material has been regraded and the site revegetated with natural irrigation.



C-11
516 D 520

KEY MAP

LAKE TAHOE REGION
HOMEWOOD
PLACER COUNTY, CALIFORNIA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S. E. H.
DATE: October 1971

TYPE OF	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Homewood Canyon Creek Downstream of Tahoe Ski Bowl.

PROJECT NUMBER: PA 158N

TRPA MAP: C-11

WATERSHED NAME (NUMBER): Homewood Canyon Creek (100)

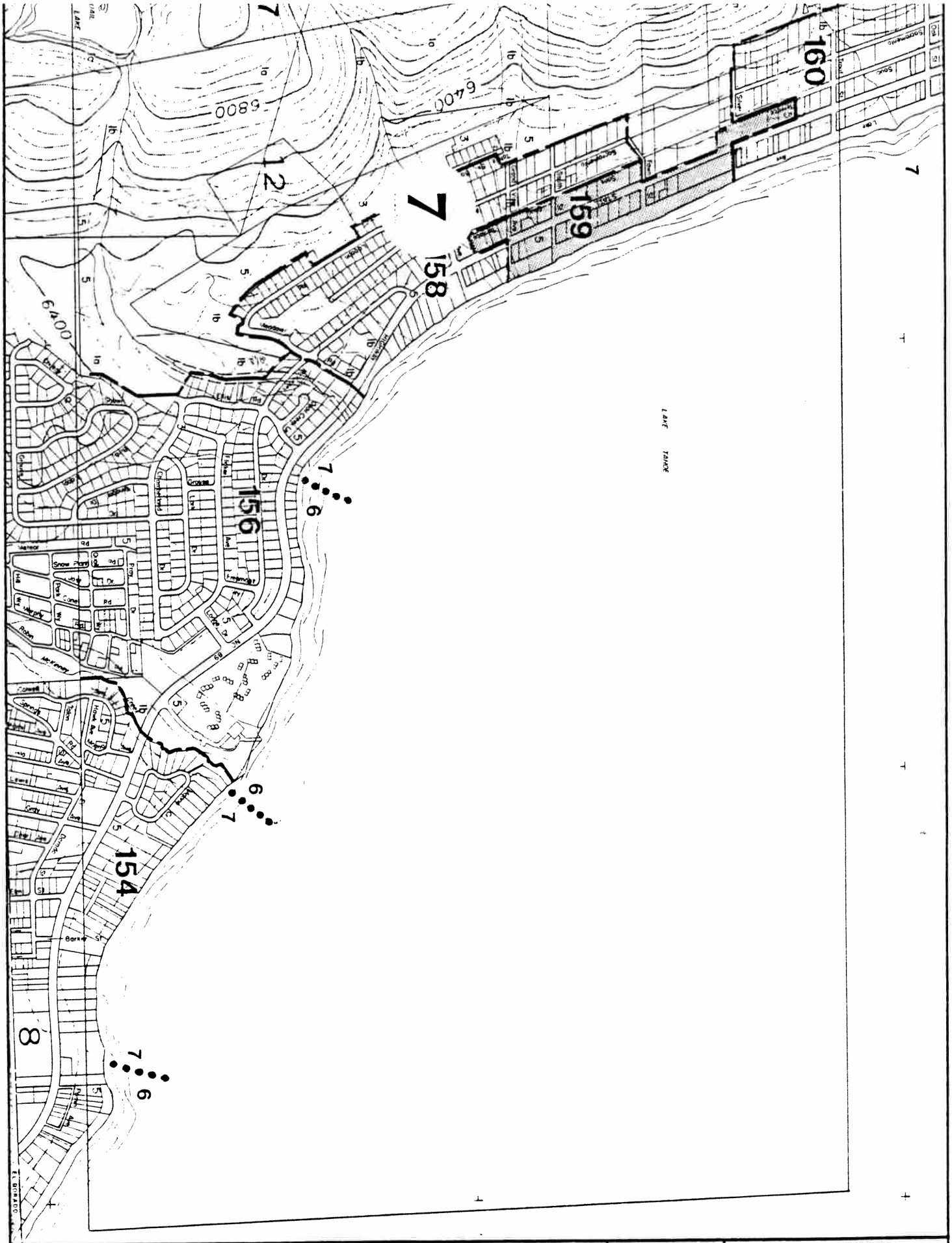
PRIORITY CATEGORY: High

PROJECT LOCATION: The project site is located immediately downstream of Tahoe Ski Bowl on the west shore of Lake Tahoe in Homewood, Placer County. Affected properties include the ski area development (lodge and parking facilities) and road access to the facility. The affected area consists of Tallac soils, LC 3 and LC 5 with an SEZ rating.

SITE DESCRIPTION/FIELD ANALYSIS: The project site of approximately 10 acres is characterized by excessive impervious surface over fill material to accommodate the ski resort facility. Riparian and conifer vegetation are found at the perimeter of the paved parking area. The ski slopes appear to be stabilized with grass species. There are no existing drainage improvements in the project site. Spring runoff flows unrestricted from the facility and access road to Homewood Canyon Creek carrying grease, oil and other pollutants.

RESTORATION POTENTIAL: Restoration of the site includes drainage improvements along the perimeter of the paved areas, energy dissapators to slow spring runoff, storm drainage along the access road, and revegetation with riparian species. It does not appear economically feasible to remove the fill and parking area.

IMPLEMENTATION: A voluntary Action Plan should be prepared by owner to implement drainage improvements to assist in SEZ restoration.



C-11
516 D 520

KEY MAP

LAKE TAHOE REGION
HOMEWOOD
PLACER COUNTY, CALIFORNIA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S.E.H.
DATE: October 1971

NO.	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Grand View Avenue, Homewood

PROJECT NUMBER: PA 159

TRPA MAP: C-11

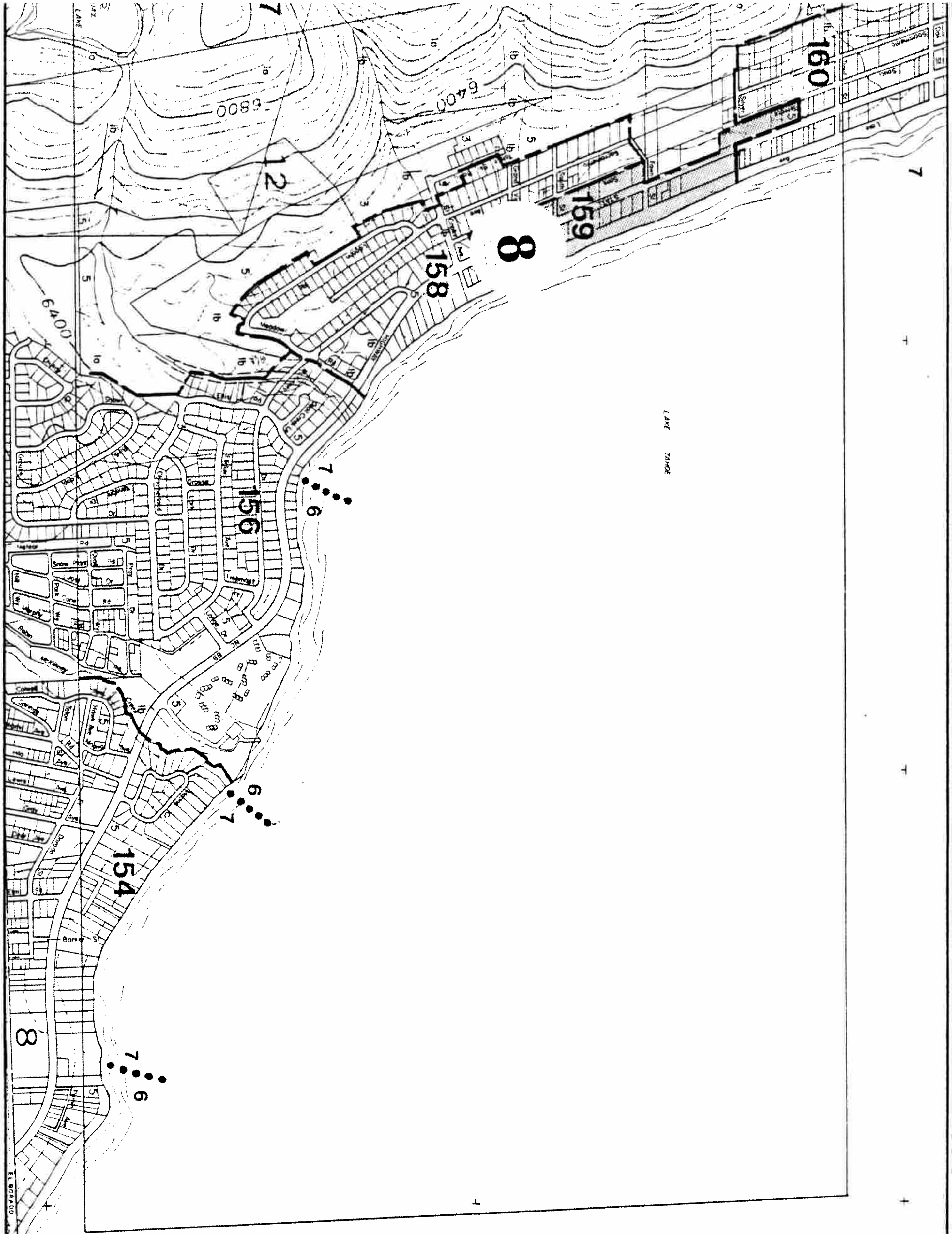
WATERSHED NAME (NUMBER): Intervening Area Between Homewood and Madden Creeks (101)

PRIORITY CATEGORY: High

PROJECT LOCATION: The project area of approximately 5 acres encompasses the area mapped as Grand View Avenue in Homewood, Placer County. Grand View Avenue itself was never constructed; but the area does provide access to a commercial warehouse.

SITE DESCRIPTION/FIELD ANALYSIS: Riparian vegetation is evident through the project site. There are several unpaved streets and large warehouses in the vicinity. Large amounts of fill material have been deposited for roads. During peak spring runoff, unpaved areas contribute to degradation of surface water quality. Fill material and road disturbance have altered the stream channel.

RESTORATION POTENTIAL: Install storm drainage, pave roads, and revegetate barren areas.



C-11
516 D 520

KEY MAP

LAKE TAHOE REGION
HOMEWOOD
PLACER COUNTY, CALIFORNIA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S.E.H.
DATE: October 1971

DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

STREAMZONE RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Ward Creek, North-West of Highway 89

PROJECT NUMBER: 1-2, Map A-8, B-8

WATERSHED NUMBER: 106

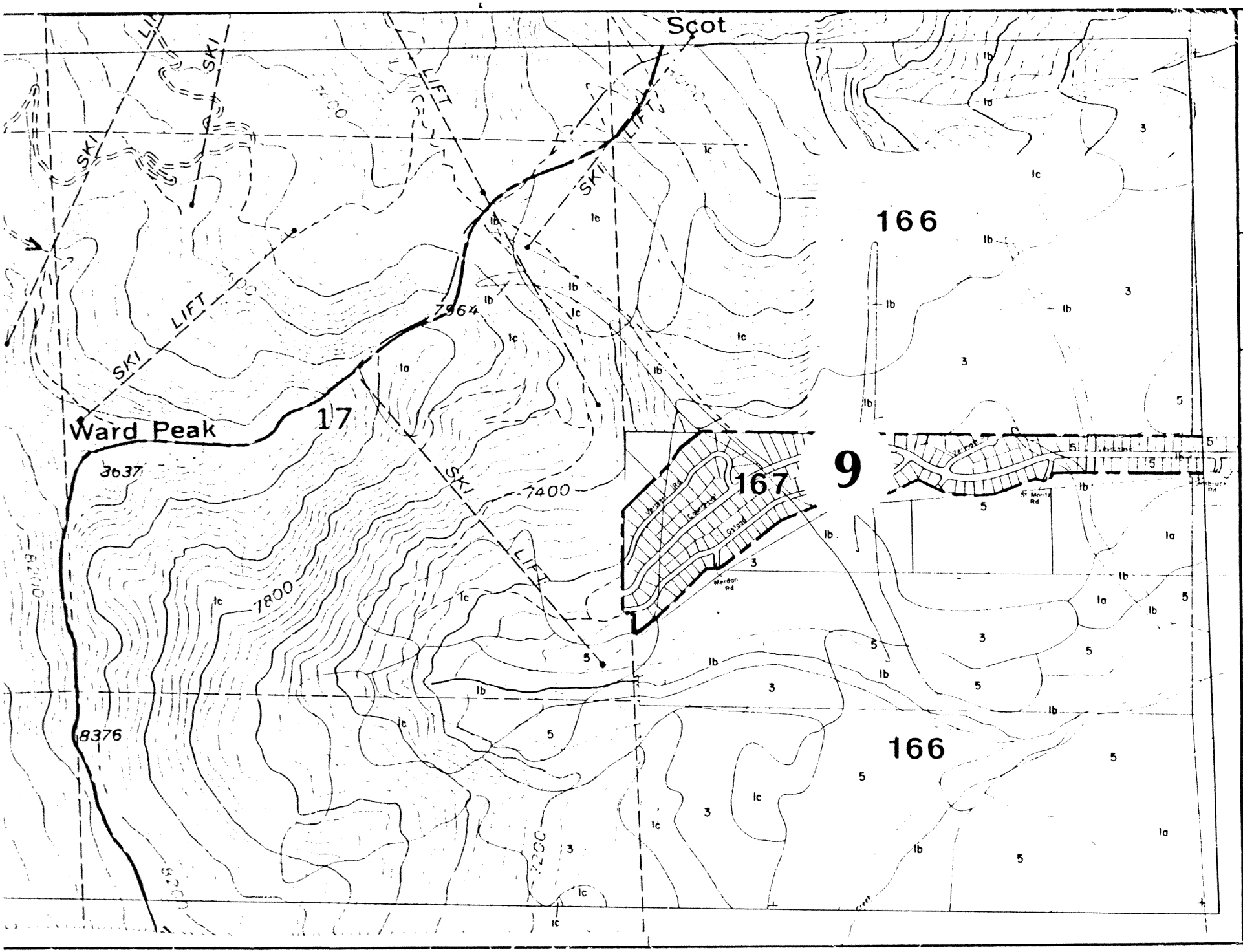
PRIORITY CATEGORY: Low

PROJECT LOCATION: The project area includes properties along Alpine Peaks/Ward Creek Road located in Placer County.

PROJECT DESCRIPTION: The entire Ward Creek Road area is characterized by naturally seeped slopes and fracture flows. Vegetation includes areas of riparian species such as lodgepole pine, willows, and grasses. There are several unpaved roads which have access off Ward Creek Road.

FIELD ANALYSIS: There has been previous erosion control work along Alpine Peaks Road; gabion toe stabilization in combination with revegetation has been effective in the less steep areas. Some of the revegetation work has failed in the steeper areas. Compaction and vegetation removal have occurred along the unpaved roads.

RESTORATION POTENTIAL: Close public access to unpaved roads by installing gates and revegetate roads. Revegetate failing slopes along Alpine Peaks Road. Restoration should also include storm and roadside drainage improvements and revegetation.



LAKE TAHOE REGION
WARD PEAK
PLACER COUNTY, CALIFORNIA

KEY MAP

A-8

VIII. SEZ RESTORATION PROJECT DESCRIPTIONS

B. Washoe County, Nevada

1. PA 030: First Creek
2. PA 030, 043: Fairview Boulevard
3. PA 036: Second Creek
4. PA 037: Martis Peak Drive
5. PA 041: Highway Construction Yard
6. PA 043: Incline Village Unit #3
7. PA 044: Incline Creek
8. PA 045: Incline Middle School
9. PA 048: Third Creek
10. CIP Projects to Improve SEZs

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: First Creek - Power Station

PROJECT NUMBER: PA 030

TRPA MAP: G-3

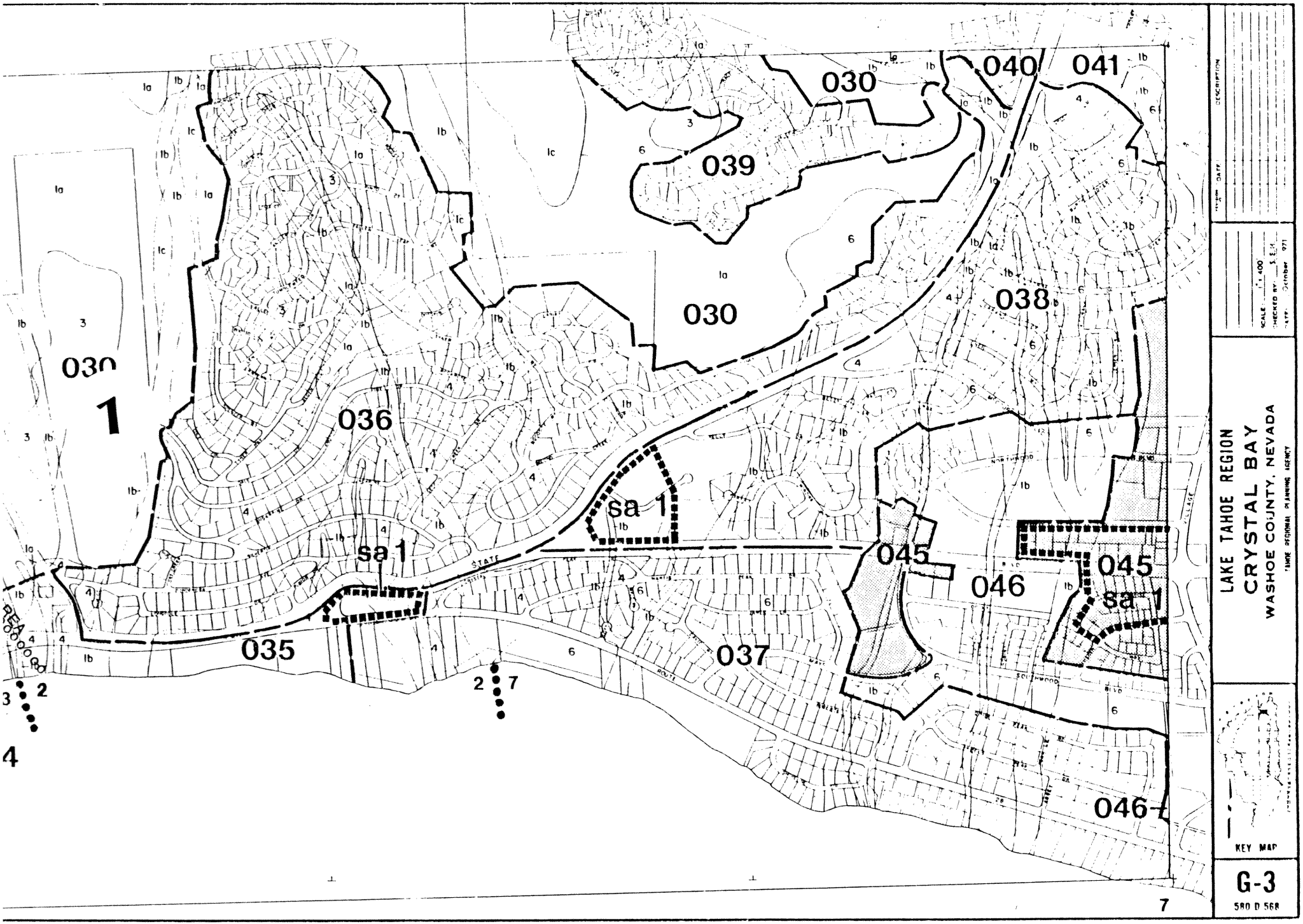
WATERSHED NAME (NUMBER): First Creek (27)

PRIORITY CATEGORY: High

PROJECT LOCATION: Incline Village, intersection of Dale Drive and Knotty Pine Drive.

SITE DESCRIPTION/FIELD ANALYSIS: The project site includes the main channel of First Creek. Extensive fill, for parking and access to a power transformer, has been placed in the SEZ. Riparian vegetation borders and channel and intermediate and pubescent wheatgrass has established on the cut slopes. Asphalt has been poured down a portion of the downstream road cut and has resulted in some gullying. Improvements at the site include gabion retaining walls and rock-lined ditches along Dale Drive the rock-lined ditches should be maintained, especially where they intersect the SEZ. Many of the rocks have been misplaced and erosion has occurred. The culverts present seem adequate to handle stream flow but the culvert at Dale and Knotty Pine Drives restricts fish passage. Also, gradients are too steep above the mouth of First Creek near the condominiums. Roadside drainage and revegetation are needed in this area.

RESTORATION POTENTIAL: BMP's such as the rock-lined ditches should be maintained. The fill area should be revegetated since it is probably not possible to remove it (fill is there because of power transformer). Also, slopes need to be revegetated at fill and on road. The culvert at Dale and Knotty Pine Drives should be corrected in order to permit fish passage. The stream gradient needs to be reduced above the mouth of First Creek in order to permit fish passage. Roadside drainage improvements should also be included.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STATE
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LAKE TAHOE REGION
CRYSTAL BAY
WASHOE COUNTY, NEVADA
TAHOE REGIONAL PLANNING AGENCY
KEY MAP
G-3
580 D 568

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Fairview Boulevard at Mt. Rose Highway in Incline Creek Watershed

PROJECT NUMBER: PA 030, 043

TRPA MAP: H-2

WATERSHED NAME (NUMBER): Incline Creek (34)

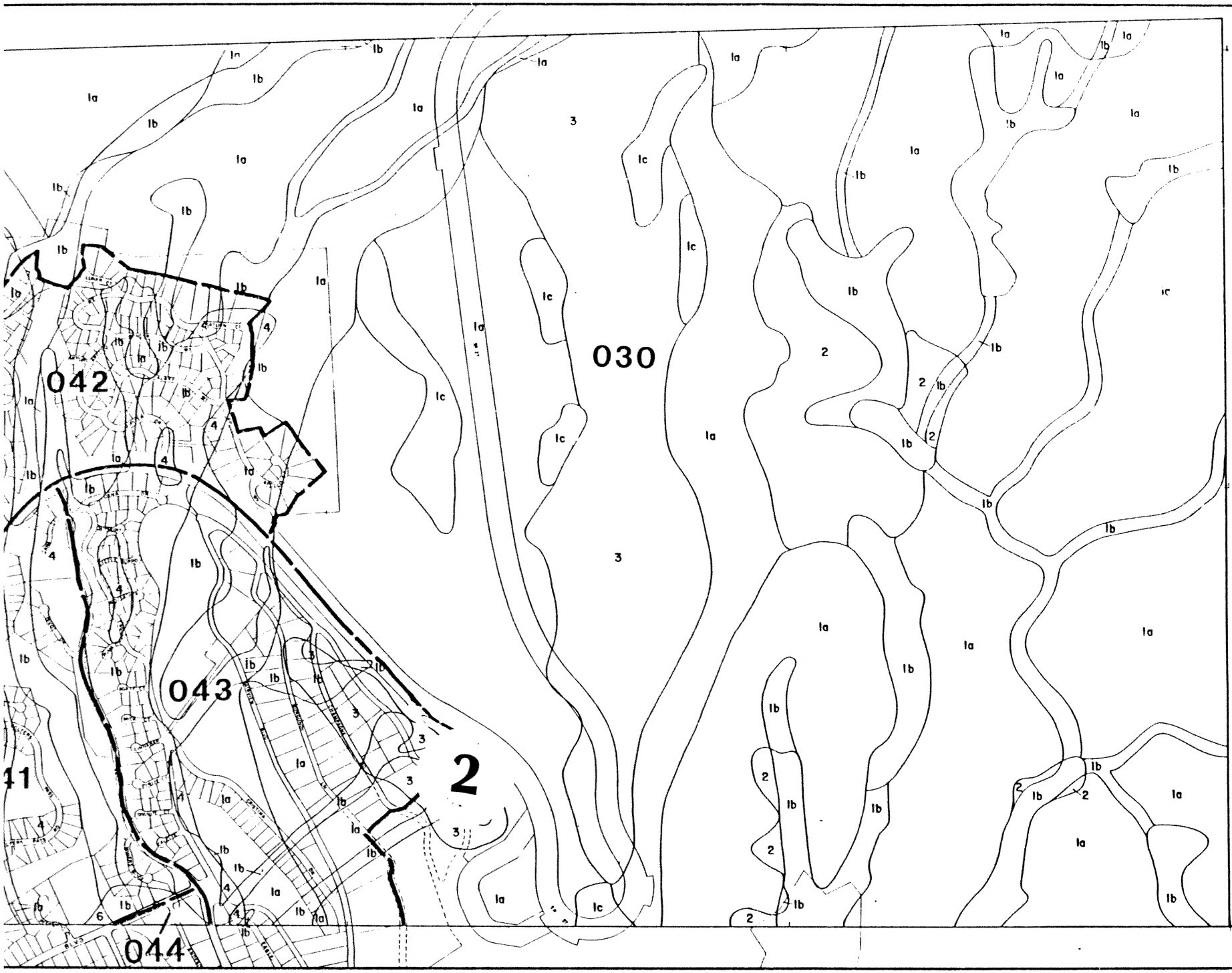
PRIORITY CATEGORY: Medium

PROJECT LOCATION: Fairview Drive off of Mt. Rose Highway, Incline Village, NV, Affected parcels include: 126-265-02, 126-265-03, 126-245-01 to -05, 126-244-01, -02. The land capability is 1B and 1A.

SITE DESCRIPTION/FIELD ANALYSIS: The project site is characterized by a high groundwater table and two minor stream channels. It is a relatively undisturbed wet recharging meadow. Vegetation consists of wet meadow grasses, aspen, willows, alders and lodge pole pine. A paved road (Fairway Boulevard) has been constructed in the stream environment zone on fill material, and a drainage network has been installed to protect the roadbed from the high groundwater table. The proposed site consists of vacant parcels except one single family dwelling on APN 126-244-02 which could be serviced by the lower portion of Fairway Boulevard.

RESTORATION POTENTIAL: The physical restoration would require removal of a short length of Fairway Boulevard which acts as a surface and subsurface flow restriction. By removing the unnecessary paved and unpaved portions of Fairway Boulevard, approximately 12 acres of recharging meadow can be restored. The affected properties are private and vacant. For the amount of restoration, little work is involved. Heavy equipment is necessary for removal of the road.

IMPLEMENTATION: TDR, lot retirement, open space easement.



LAKE TAHOE REGION
INCLINE CREEK
WASHOE COUNTY, NEVADA
TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S.E.H.
DATE: October 1971

KEY MAP

H-2
588 D 580

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Second Creek, West Tributary

PROJECT NUMBER: PA 036

TRPA MAP: G-3

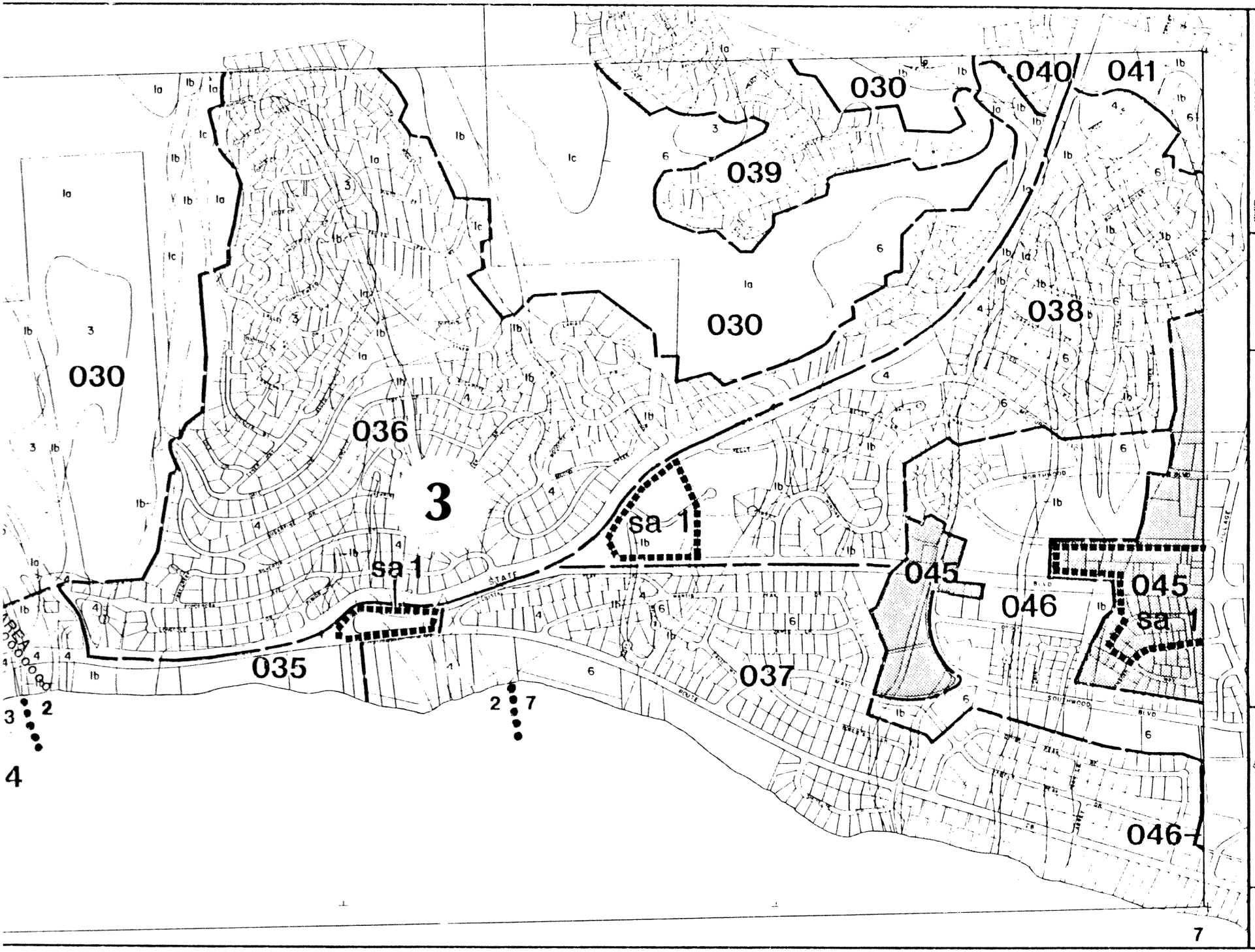
WATERSHED NAME (NUMBER): Second Creek (29A)

PRIORITY CATEGORY: Medium

PROJECT LOCATION: Project is between Sugar Pine Drive and Silvertip Drive, Incline Village

SITE DESCRIPTION/FIELD ANALYSIS: SEZ is located in a subdivision. The channel is bordered by riparian vegetation, manzanita, cedar, and fir. Unimproved roadside drainage is present (e.g. unlined ditch). There is minor streambank erosion (undercutting) caused by a downstream diversion (logs and debris in stream). Single-family dwellings encroach SEZ throughout the area.

RESTORATION POTENTIAL: Storm drainage, roadside drainage, and revegetation is needed throughout this area. Installation of BMP's at single-family dwellings and roadside drainage would effectively reduce sediment and nutrient loads to the SEZ.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STATE
SOUTHWOOD BLVD
LAKE TAHOE REGION
CRYSTAL BAY
WASHOE COUNTY, NEVADA
TAHOE REGIONAL PLANNING AGENCY
KEY MAP
G-3
580 D 568

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Martis Peak Drive

PROJECT NUMBER: PA 037

TRPA MAP: G-3

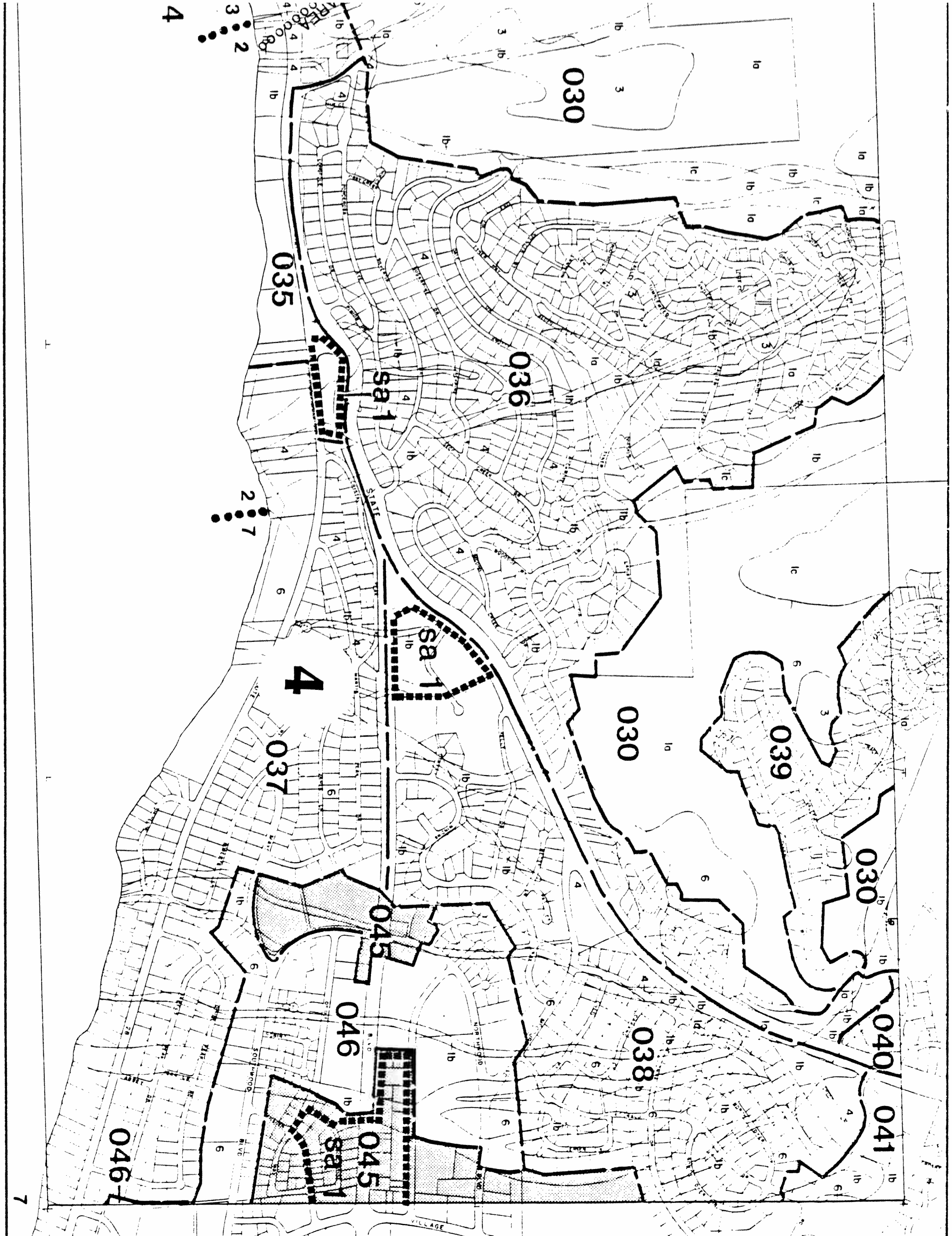
WATERSHED NAME (NUMBER): Intervening Area Between Second and Wood Creeks (30)

PRIORITY CATEGORY: Medium

PROJECT LOCATION: Site is located on Martis Peak Drive between Rifle Peak and David Way, Incline Village.

SITE DESCRIPTION/FIELD ANALYSIS: Channel was dry on July 11, 1985. Vegetation consists of riparian species and pine. Vegetation is destroyed and soil compacted due to numerous paths intersecting the SEZ. The paths have also created minor blockages and diversions in the stream channel. Single-family dwellings (SFD's) are present and encroach upon SEZ.

RESTORATION POTENTIAL: Installation of BMP's at SFD's and storm and roadside drainages would reduce sediment and nutrient delivery to SEZ. Revegetation along disturbed channel sections and possible foot traffic barriers would help stabilize the area.



G-3

580 D 568

KEY MAP

LAKE TAHOE REGION

CRYSTAL BAY

WASHOE COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'

CHECKED BY: S. E. H.

DATE: October 1971

REVISION	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Highway Construction Yard

PROJECT NUMBER: PA 041

TRPA MAP: H-2

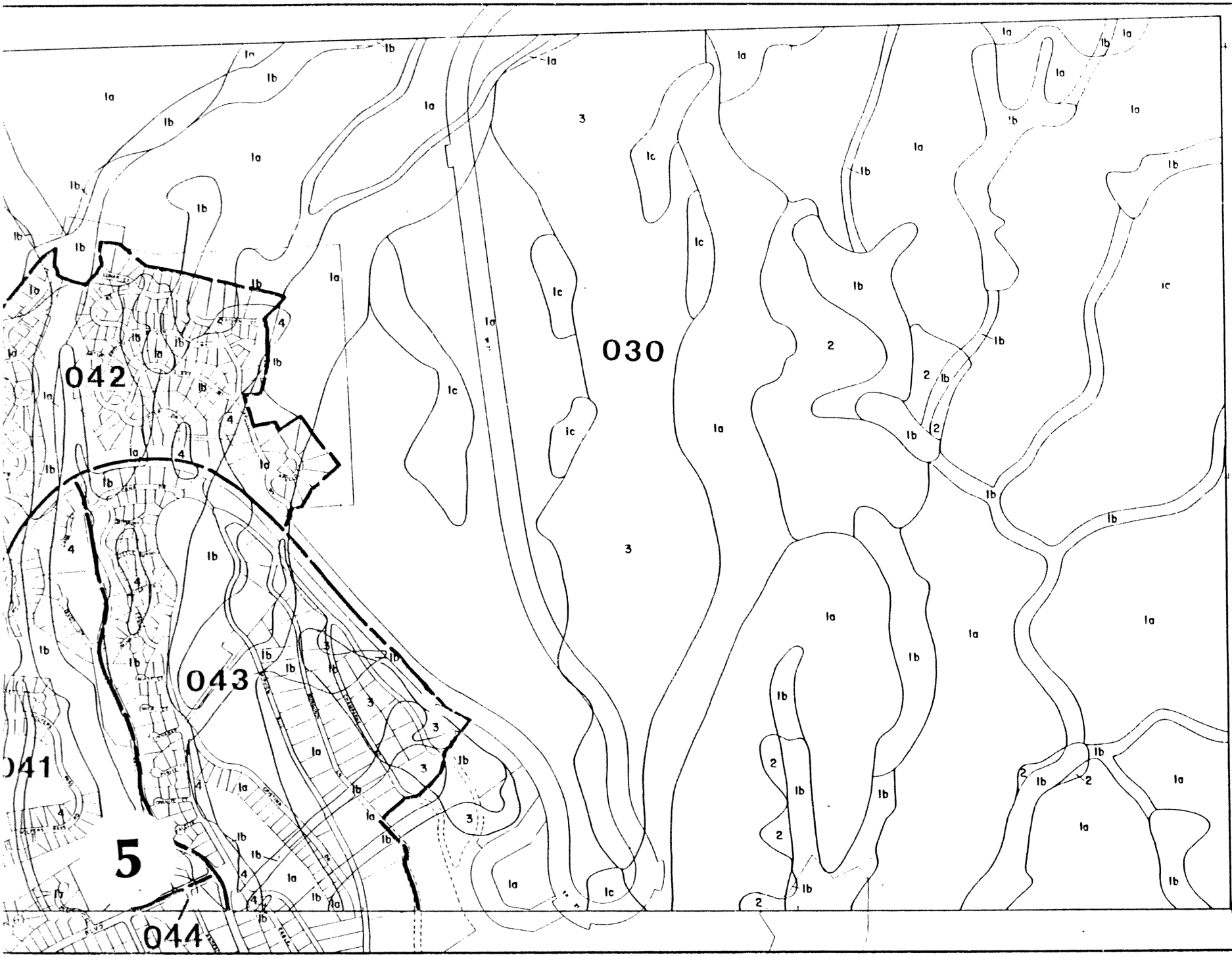
WATERSHED NAME (NUMBER): Third Creek (33)

PRIORITY CATEGORY: High

PROJECT LOCATION: Main Channel of Third Creek at Village Boulevard between ~~Deer~~sight Court and Country Club Drive, Incline Village, Washoe County, Nevada. Soil type is IsD (4) and IsC (6) with streamzone capability rating.

SITE DESCRIPTION/FIELD ANALYSIS: The project site consists of approximately 5 acres of restorable steamzone. Large amounts of fill material have been deposited in the streamzone to accommodate a storage yard. The fenced storage yard is presently vacant. Third Creek is channelized due to culverts and fill material. Water quality is very poor - a large amount of suspended sediment is evident. The high velocity and channelization is causing severe bank erosion.

RESTORATION POTENTIAL: Removal of fill material and a possible sediment basin/ holding pond would be an advantageous restoration direction here. Recontouring and revegetation with native riparian species may reduce velocity and erosive potential further downstream. Revegetation, slope stabilization, and adequate roadside drainage will assist in restoration of this site.



LAKE TAHOE REGION
INCLINE CREEK
WASHOE COUNTY, NEVADA
TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S.E.H.
DATE: October 1971

KEY MAP

H-2
588 D 580

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Incline Village, Unit #3

PROJECT NUMBER: PA 043

TRPA MAP: H-2

WATERSHED NAME (NUMBER): Incline Creek (34A)

PRIORITY CATEGORY: High

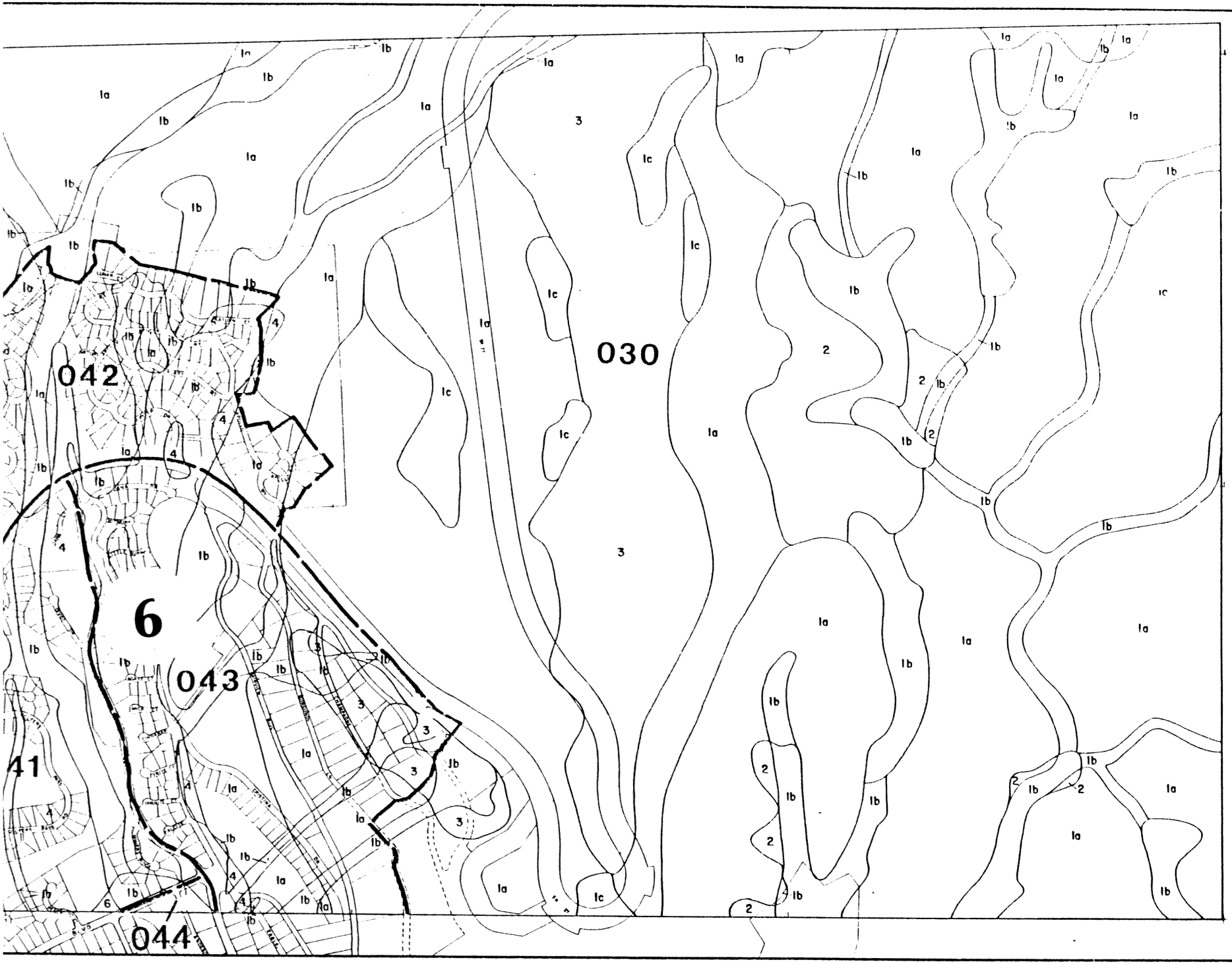
PROJECT LOCATION: This project is located on the NW tributary to Incline Creek. The project site of approximately 10 acres includes the portion of Incline Village #3 Subdivision between Country Club Drive and Eagle Drive from the Mt. Rose Highway to Village Boulevard, Washoe County, Nevada. Soil type is IsD (4) with the entire area classified as SEZ.

SITE DESCRIPTION/FIELD ANALYSIS: There are a series of cul-de-sacs built on fill material which encroach in the Incline Creek stream environment zone. The subdivision is approximately 30% built out. As a result of the extensive amount of fill material deposited in the SEZ, the stream is highly channelized. Stream bank erosion is evident on both sides of Incline Creek. This subdivision also has high ground water areas; there are extensive subsurface drainage systems to protect roadbeds.

RESTORATION POTENTIAL: Access to the subdivision is possible from Country Club Drive via Dana and Eagle Drives. Presently Dana Drive does not directly access any residences and sits entirely in the streamzone. This portion of Dana Drive could be removed and restored.

Roadside drainage from Country Club Drive is speeding bankside erosion. Culverts draining into Incline Creek should be rock lined and banks stabilized. The extensive roadside drainage installed on the cul-de-sacs requires energy dissipators at the end of each cul-de-sac.

This subdivision may be a potential site for transfer of existing coverage on those cul-de-sacs where only one or two residences exist (such as, Puma Court, Granite Court, Calcite Court).



LAKE TAHOE REGION
INCLINE CREEK
WASHOE COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE 1" = 400'
CHECKED BY S.E.H.
DATE OCTOBER 1971

KEY MAP

H-2

588 D 580

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Incline Creek/Country Club Drive from Fairway to Village Boulevard

PROJECT NUMBER: PA 044

TRPA MAP: H-3

WATERSHED NAME (NUMBER): Incline Creek (34A)

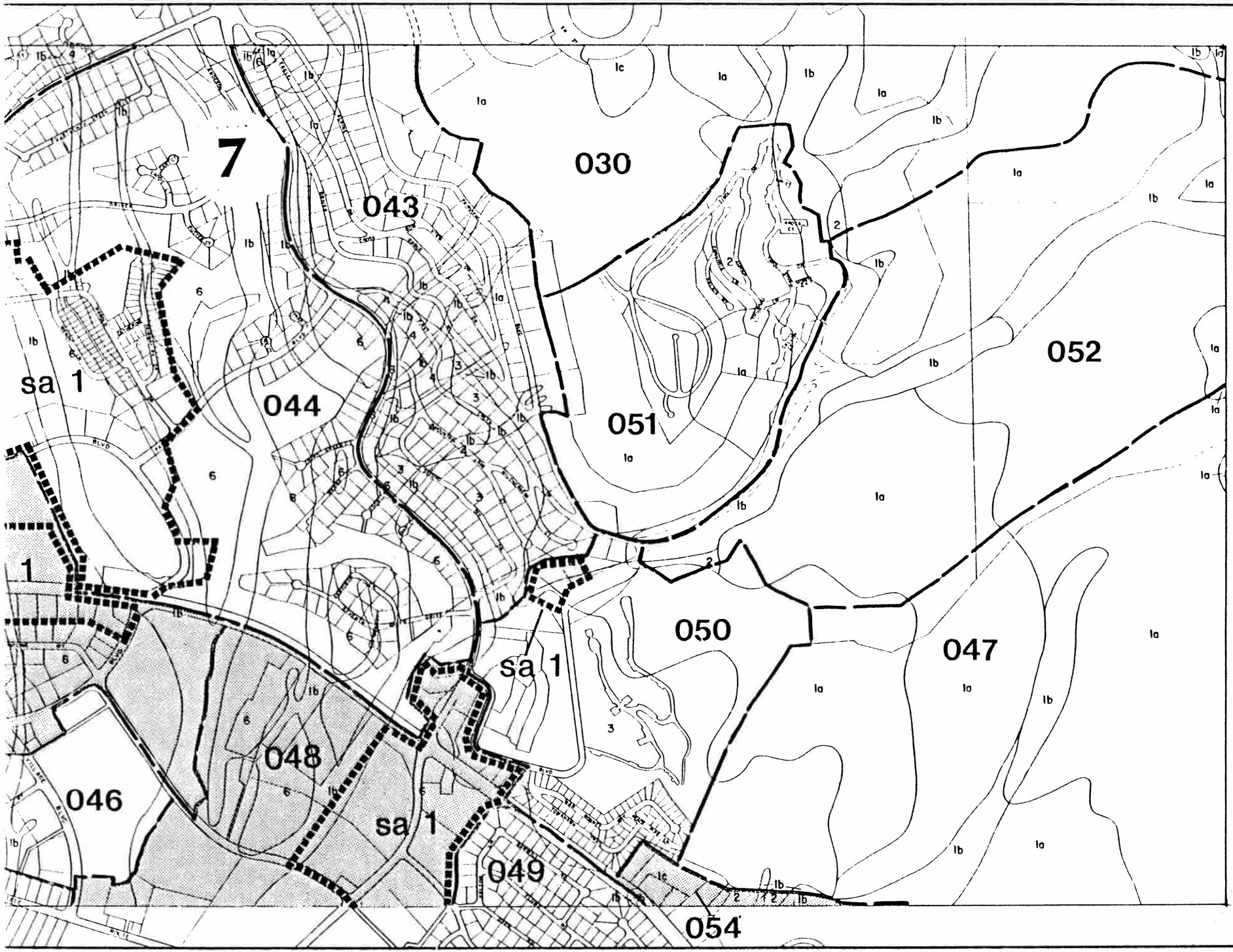
PRIORITY CATEGORY: Medium

PROJECT LOCATION: This project is located on the NW tributary to Incline Creek. The project site consists of properties located on Country Club Drive and Anderson Drive between Village Boulevard and Fairway Boulevard, Incline Village, Washoe County, Nevada.

SITE DESCRIPTION/FIELD ANALYSIS: This project site of approximately 10 acres consists of an 80% built out neighborhood of single family residences along Country Club and Anderson Drive. The residences are placed directly in the streamzone and have very large culverts under driveways or private bridges for vehicle access.

There is a considerable amount of fill for the residences in this area. The culverts are undersized and cannot accommodate peak stream flow. Extreme channel bank erosion is evident. The lower portion of Anderson Drive does not currently access any residences.

RESTORATION POTENTIAL: Since most properties are developed here, removal of existing residences is not economically feasible. Subdivision drainage improvements such as adequate culverts, slope stabilization and 208 BMP's for all residences should improve water quality. Mechanical stream bank stabilization should be commenced on the upper portion of Anderson Drive and along Country Club Drive. The lower portion of Anderson Drive should be removed, recontoured and revegetated. Storm drainage on Country Club Drive, adequate roadside drainage on Anderson and Country Club Drive, and energy dissipators should all be incorporated into the project site to decrease flow intensity and erosional capacity of peak spring runoff and in turn improve water quality of runoff.



DESCRIPTION

DATE

SCALE: 1" = 400'

CHECKED BY: S.E.M.

DATE: October 1971

LAKE TAHOE REGION

INCLINE VILLAGE

WASHOE COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

KEY MAP

H-3

SRO D-580

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Incline Middle School/IVGID Tennis Courts - Third Creek

PROJECT NUMBER: PA 045

TRPA MAP: H-3

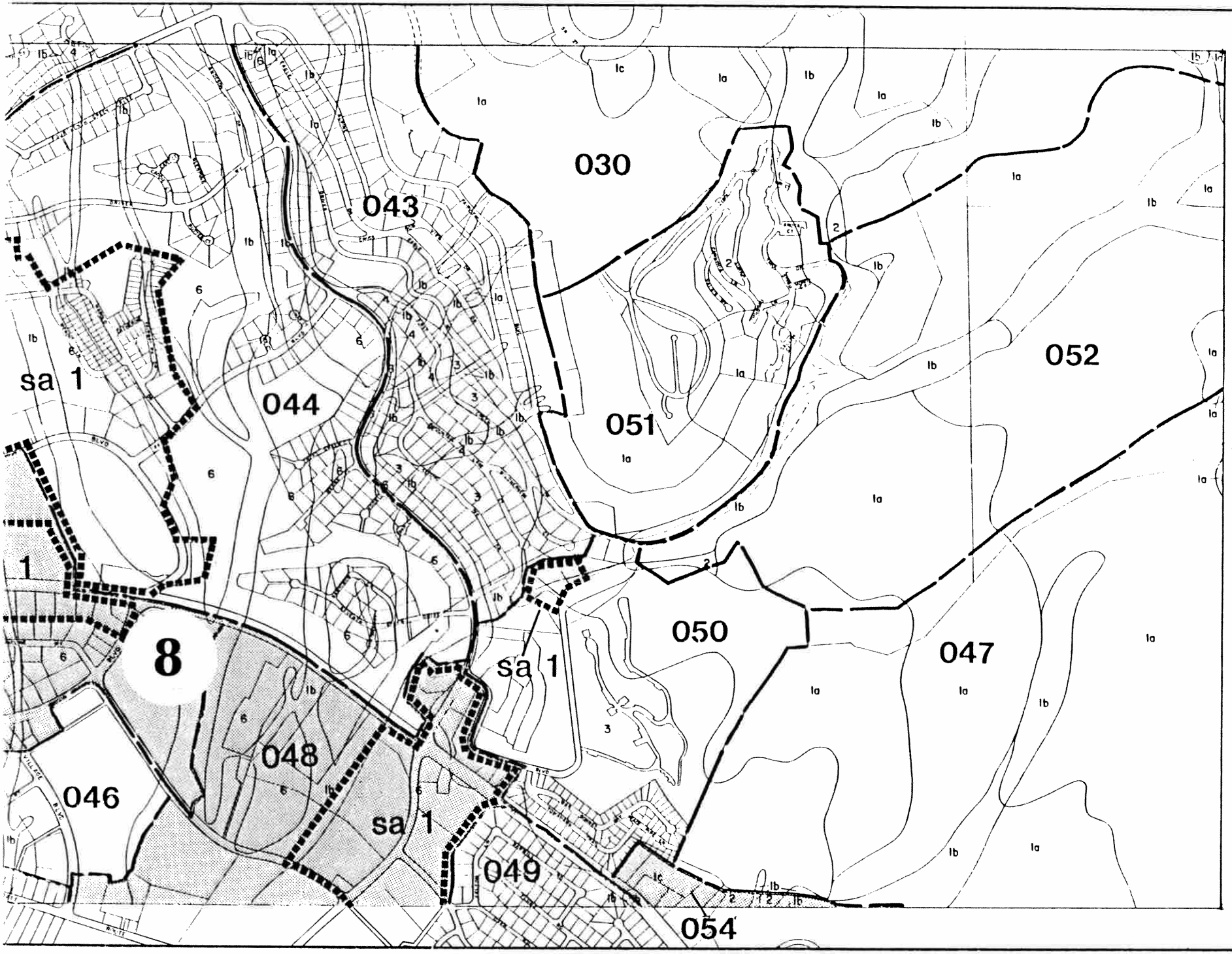
WATERSHED NAME (NUMBER): Third Creek (33)

PRIORITY CATEGORY: Low

PROJECT LOCATION: The project area of approximately 20 acres is located at the corner of Lake Tahoe Boulevard and Southwood Boulevard, Incline Village, Washoe County, Nevada. Affected APN's include 127-030-16 and 15.

SITE DESCRIPTION/FIELD ANALYSIS: The main branch of Third Creek flows between the fill material placed for the ballfields at the school and the IVGID Tennis Courts. The stream is channelized through a culvert under Lake Tahoe Boulevard. The channel itself is in fairly good condition although there is evidence of bank erosion. Placement of fill material has prevented stream from flowing to flood plain. A small pathway on fill acts as a dam. The culvert placed under pathway is inadequate.

RESTORATION POTENTIAL: The lower portion of the school property (on fill material), which is not utilized, could be restored back to a functioning meadow area. Bank stabilization is necessary in some spots. Revegetation of much of the area should be incorporated into this project. Proper roadside drainage facilities will assist in better surface water quality.



LAKE TAHOE REGION
INCLINE VILLAGE
WASHOE COUNTY, NEVADA
TAHOE REGIONAL PLANNING AGENCY

KEY MAP

H-3
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TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Third Creek Highway 28

PROJECT NUMBER: PA 048

TRPA MAP: H-3, H-4

WATERSHED NAME (NUMBER): Third Creek (33)

PRIORITY CATEGORY: Medium

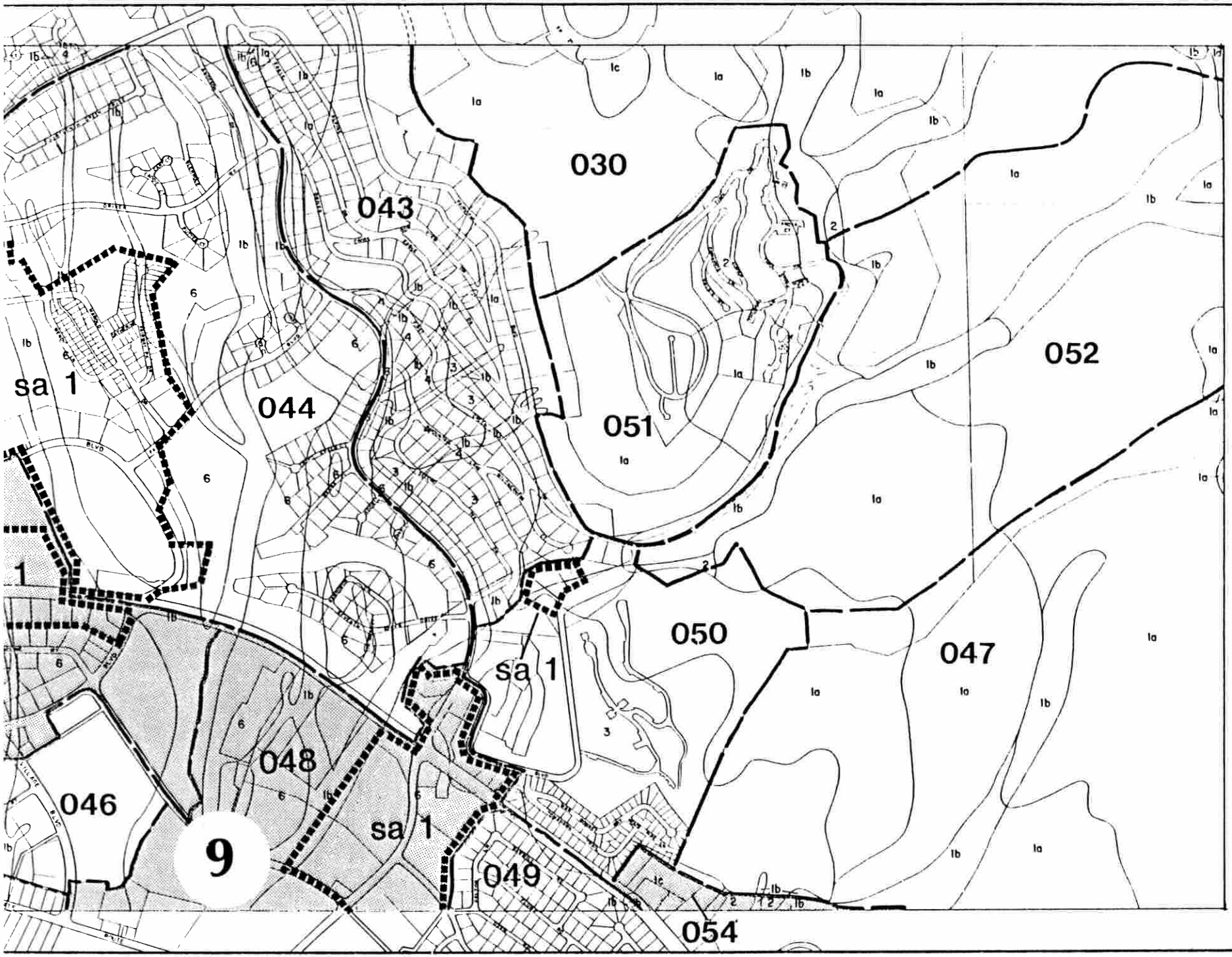
PROJECT LOCATION: This project site is located between Lakeshore Boulevard and Incline Way in Incline Village, Washoe County, Nevada. Affected parcels include: 127-010-01, 03, 04, 05.

SITE DESCRIPTION: The project site consisting of approximately 25 acres includes two paved parking lots, a ball field and an unpaved overflow parking lot on fill material in the Third Creek stream environment zone. A small park adjacent to the Hyatt borders the banks Third Creek. A par exercise course is located on the unpaved overflow parking lot.

FIELD ANALYSIS: Vehicle access to the three parking lots is from Lakeshore Boulevard with an additional gate to access the overflow lot from Incline Way. The small park adjacent to the Hyatt encroaches to the stream bed; fertilizer application is a problem.

Culverts under Incline Way are inadequate for streamflow and are causing ponding upstream with subsequent bank erosion and downstream scour. Rock riprap has been placed along the streambank above Incline Way, but is not effective. Water quality is poor compared to upstream flow; suspended sediment is evident. It appears that the ballpark and paved parking areas are contributing to poor water quality.

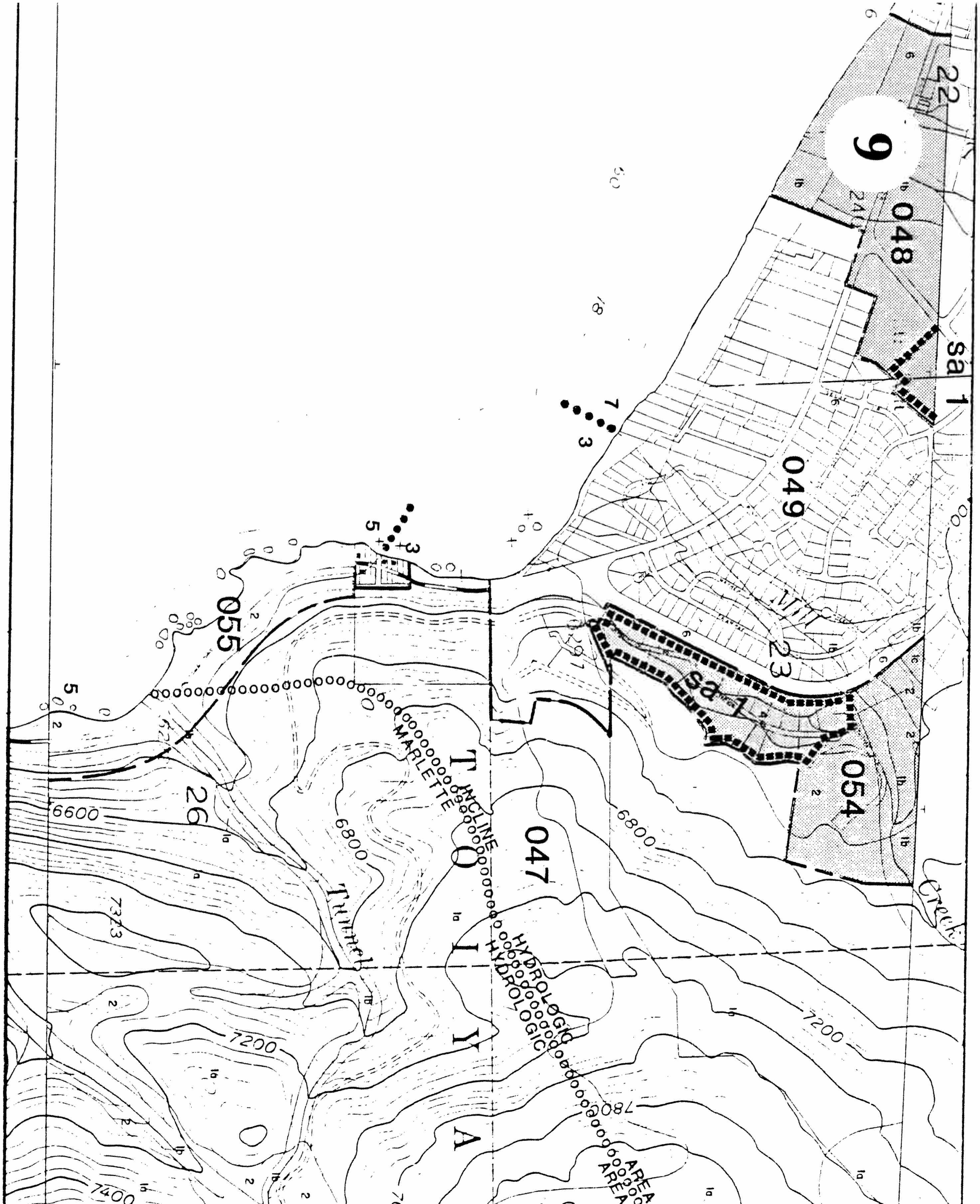
RESTORATION POTENTIAL: The unpaved parking overflow area on fill material should be removed, the area recontoured and revegetated to act as a functioning SEZ. Best Management Practices including rocklined drainage facilities should be installed for the paved lots and ballpark. The lawn encroachment into the stream channel should be replaced with natural riparian vegetation. Revegetation, roadside drainage, storm drainage and energy dissipators will assist in reducing erosion and sediment and nutrient load to the SEZ.



LAKE TAHOE REGION
INCLINE VILLAGE
WASHOE COUNTY, NEVADA
TAHOE REGIONAL PLANNING AGENCY

KEY MAP

H-3
580 D 580



H-4

KEY MAP

LAKE TAHOE REGION
INCLINE BEACH
WASHOE COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE 1" = 400
CHECKED BY S.E.H.
DATE October '71

REVISION	DATE	DESCRIPTION

CIP PROJECTS TO IMPROVE SEZs - INCLINE VILLAGE

Many of the project sites are in or adjacent to subdivisions with single-family dwellings encroaching the SEZ's. Since it is unrealistic to remove the SFD's, other measures to reduce runoff velocity and nutrient load must be found. The Capital Improvement Program (CIP) includes subdivision improvements, such as BMP's. The implementation of BMP's in these areas would assist the SEZ's by removing nutrient and sediment loads and reducing the erosion potential of the runoff. The project sites listed below are all incorporated in subdivisions. Although some of the improvements will consist of roadside and storm drainage systems, every effort should be made to provide treatment before the system drains into a live stream. The implementation of the CIP will assist the streamzone restoration program by treating the runoff at the source, before it reaches the stream.

1. PA 036, 040 - Wood Creek at Barbara Street; land capability 1a and 1b, soil type CaF. Vegetation is primarily riparian and the stream channel seems stable. There is no evidence of gullies, stream bank erosion, stream diversions or blockages. Improvements include roadside and storm drainage and BMP's on single-family lots. Acreage estimate - 2 acres.

2. PA 038 - Wood Creek at Incline High School; land capability 6, soil type IsC. Roadside and storm drainage would be the major improvements. Acreage estimate - 5 acres.

3. PA 045 - Wood Creek south of High School; land capability 6, soil type IsC. Roadside and storm drainage would be the major improvements. Acreage estimate - 5 acres.

4. PA 040 - Third Creek at Geraldine Street; land capability 1a and 1b, soil type Umf. Implementation should include roadside and storm drainage and BMP's on single-family lots. Acreage estimate - 5-10 acres.

5. PA 041 - Incline Creek - at golf course, Wilson Way, land capability 1b, soil type IsD. This area has been developed and the stream channel diverted. Implementation should include roadside and storm drainage and BMP's on single-family lots. Acreage estimate - 5-10 acres.

6. PA 041 - Third Creek at mobile home park, condo development, church at Campbell Road, land capability 1a and 1b soil type IsD. Stream winds through a trailer park and condominium complex, however, the channel seems stable. Road and storm drainage and revegetation should be implemented. Acreage estimate - 5-10 acres.

7. PA 040 - Third Creek at Jennifer Street; land capability 1a and 1b, soil type IsD. Subdivision improvements are necessary throughout this high erosional area. Slope stabilization, revegetation and road and storm drainage should be implemented. Acreage estimate 10-20 acres.

8. PA 044 - Main tributary, Third Creek at Anderson, Glenrock, south of the Mount Rose Highway, land capability 1b, soil type IsC. Single-family dwellings and roads are located in the SEZ. Roadside and storm drainage, energy dissipators, and BMP's on individual lots are necessary. Acreage estimate - 10-20 acres.

9. PA 048 - Incline Creek, south of Highway 28 to Lake, near Hyatt, land capability 1b, 6, soil type IsC. Fill has been placed in the SEZ for a road. A trail is being constructed (as part of the Hyatt exercise course) and vegetation has been removed along this stretch. The channel has been riprapped on both sides along this trail. The baffles are deteriorating at the box culvert at Lakeshore Boulevard. Also, access restrictions impede fish movements at the cement utility barrier near the Hyatt Hotel. There are ball fields on one side of the stream with an unpaved road for access. The disturbed areas should be revegetated and roadside and storm drainage and energy dissipators should be installed. Maintain the baffles and repair or replace fish access pools to all cement utility barriers. At Tahoe Boulevard, replace culvert or buildup pools to permit fish access through all culverts. Acreage estimate - 15 acres.

Explanation of Land Capabilities and Soil Types

Land Capability

1a - Land consists of extensive areas of steep mountainous lands with very shallow soils. These areas are the principal sources of sediment that cause damage to streams, water storage facilities, and structures.

1b - Land consists of stream channels, marshes, flood plains, and meadows. These land are naturally wet and poorly drained and are critical areas for management and protection of water resources. Policy for these lands should reflect their value as floodwater and sediment storage areas, wildlife habitat, and fish spawning grounds.

6 - Land of capability 6 is well suited for urbanization, active recreation, and forestry uses. It has some minor slope or drainage problems, which influence the manner of development.

Soil Types

CaF - Cagwin-Rock outcrop complex, 30-50% slope, soil on granitic uplands, high erosional hazard.

IsC - Inville stony, coarse, sandy loam, 2-9% slope; soil is on alluvial fans, terraces and floodplains.

IsD - Inville stony, coarse, sandy loam, 9-15% slope, soil is on alluvial fans and terraces.

Umf - Umpa very stony, sandy loam, 30-50% slope, high erosional hazard.

VIII. SEZ RESTORATION PROJECT DESCRIPTIONS

C. Douglas County, Nevada

1. PA 061: Logan House Creek
2. PA 066E: Zephyr Cove Creek
3. PA 066W: Zephyr Cove Creek
4. PA 076: Kingsbury Meadows
5. PA 079: Burke Creek
6. PA 081N: Andria Street Park
7. PA 081S: Aspen Way Channel
8. PA 082: Ansaldo Acres Meadow
9. PA 084: Edgewood Creek Road

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Logan House Creek

PROJECT NUMBER: PA 061

TRPA MAP: H-11

WATERSHED NAME (NUMBER): Logan House Creek (54)

PRIORITY CATEGORY: Medium

PROJECT LOCATION: Logan Creek Estates off Highway 50 north of Cave Rock and south of Glenbrook in Douglas County, Nevada. The project site is approximately 5 acres.

SITE DESCRIPTION/FIELD ANALYSIS: Logan House Creek has been disturbed by placement of Logan Creek Estates Subdivision. The subdivision suffers from a lack of adequate improvements (only the lower portion has paved roads). The stream flows through the edge of the subdivision into a culvert under Highway 50. An unpaved road in upper Logan Creek Estates Subdivision crosses the stream on fill material. The roadbed acts as a dam due to inadequate culvert size for the stream flow. There is substantial fill material at the crossroads of Highway 50 into the subdivision. The stream is highly channelized due to subdivision fill material and culvertization. Downstream of highway, severe bank erosion and stream diversion have occurred.

RESTORATION POTENTIAL: The unpaved portion of Logan Creek Estate is contributing sediment to Logan Creek. These roads should be removed, recontoured, stabilized and revegetated. The road crossing the creek should be removed and stream banks stabilized. Downstream across Highway 50, bank erosion and stream diversion should be reduced through stabilization. Storm drainage improvements, slope stabilization and revegetation are necessary in the lower paved portion of Logan Creek Estates Subdivision.

H-11

516 D 580

KEY MAP

LAKE TAHOE REGION

SHAKESPEARE POINT

DOUGLAS COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE 1" = 400'

CHECKED BY: S. E. H.

DATE: October 1971

REVISION NO.	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: South Zephyr Creek East of Highway 50

PROJECT NUMBER: PA 066E

TRPA MAP: H-14

WATERSHED NAME (NUMBER): South Zephyr Creek (62)

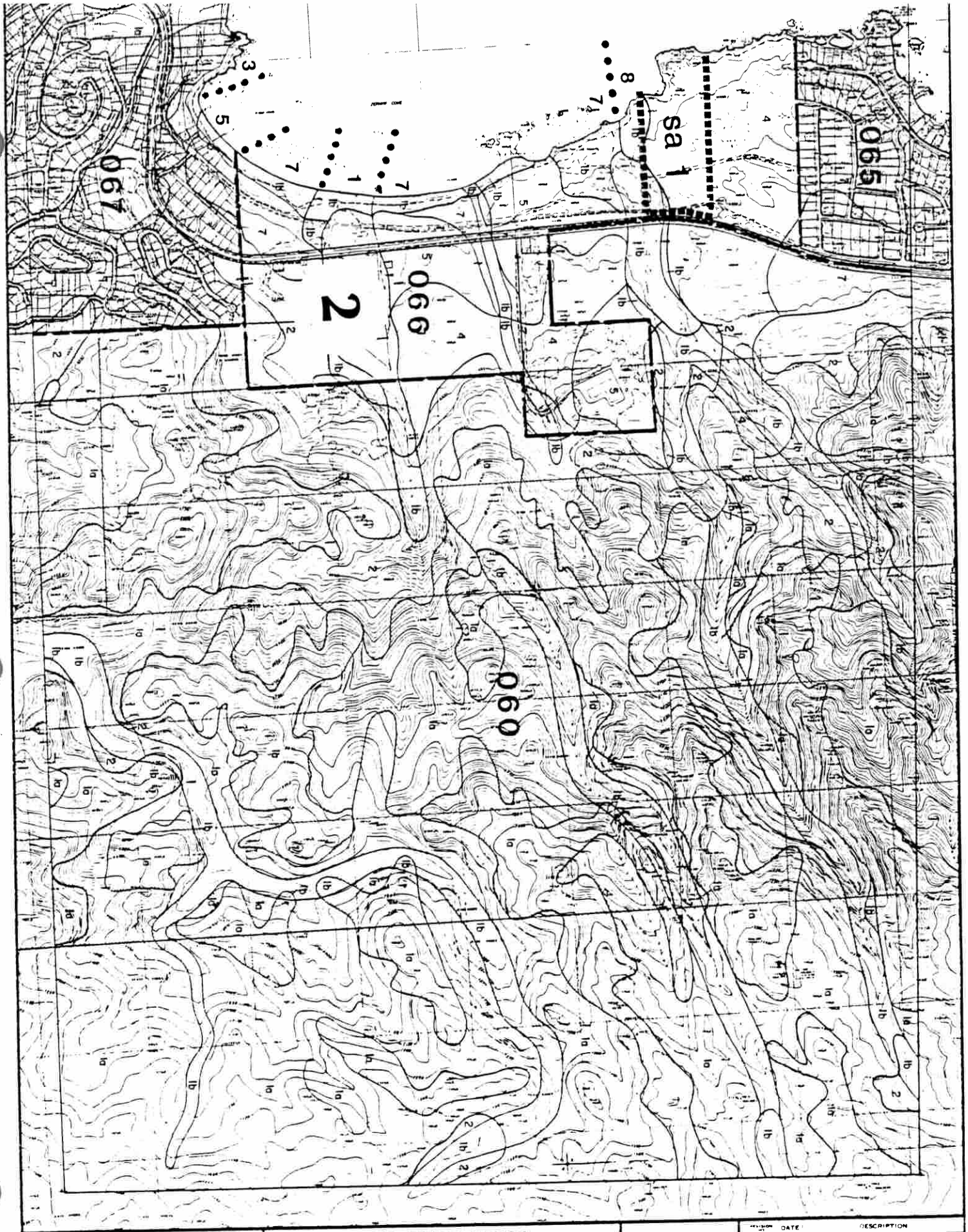
PRIORITY CATEGORY: Low

PROJECT LOCATION: The project site consisting of approximately 5 acres is located immediately east of Highway 50 at the Zephyr Cove Resort Area, Douglas County, Nevada.

SITE DESCRIPTION/FIELD ANALYSIS: The site, owned by the USFS consists of a large, relatively undisturbed meadow. Riding stables are located on the northern boundary of the project site and are maintained by lease arrangement with the Forest Service.

The unpaved road, parking area, and riding stables encroach into the meadow resulting in compaction and destroyed vegetation.

RESTORATION POTENTIAL: Relocate corrals out of meadow. Restore compacted area of natural state and revegetate with native meadow species. Roadside drainage will control runoff into the meadow.



H-14

492 0 580

KEY MAP

LAKE TAHOE REGION

ZEPHYR COVE

DOUGLAS COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'

CHECKED BY: S. E. H.

DATE: October 1971

REVISION NO.	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: South Zephyr Creek West of Highway 50

PROJECT NUMBER: PA 066W

TRPA MAP: H-14

WATERSHED NAME (NUMBER): South Zephyr Creek (62)

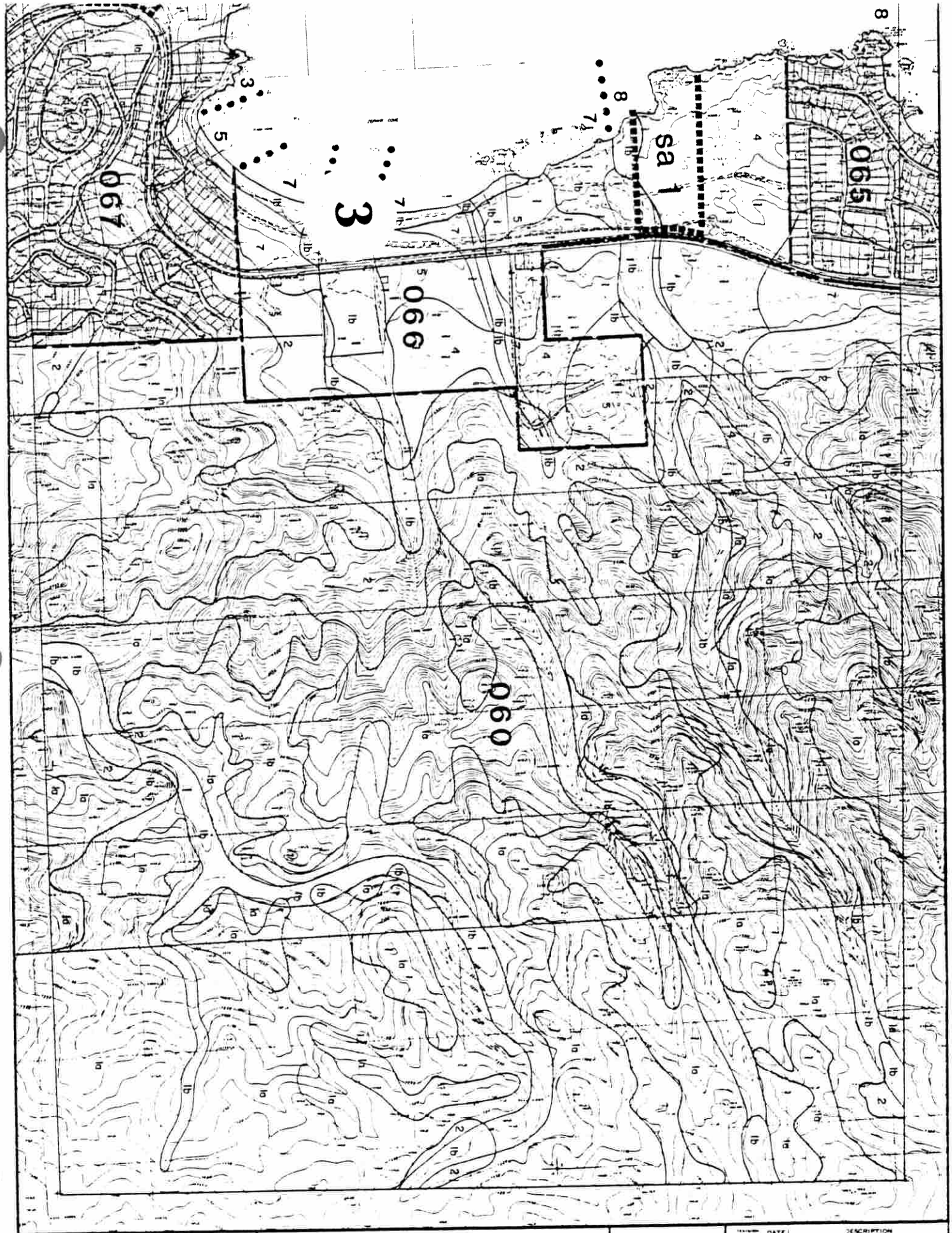
PRIORITY CATEGORY: High

PROJECT LOCATION: The project site consisting of approximately 5 acres is located west of Highway 50 at Zephyr Cove resort area, Douglas County, Nevada.

SITE DESCRIPTION/FIELD ANALYSIS: The site includes a natural meadow which has been disturbed by placement of an unpaved parking area for access to the Zephyr Cove recreation area.

A portion of the meadow is compacted and gravelled for recreation parking for the M. S. Dixie and Zephyr Cove Branch. The stream has been diverted under Highway 50 via an undersized culvert. The USFS has done some previous restoration work on the mouth of the stream but further work is necessary.

RESTORATION POTENTIAL: Remove the portion of parking area immediately adjacent to the stream and revegetate with riparian species. The remainder of the parking area should be paved and infiltration trenches installed along the perimeter to reduce runoff directly to the stream.



H-14
492 D 580

KEY MAP

LAKE TAHOE REGION
ZEPHYR COVE
DOUGLAS COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S. E. H.
DATE: October 971

NO.	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Kingsbury Meadows/Burke Creek

PROJECT NUMBER: PA 076

TRPA MAP: H-16

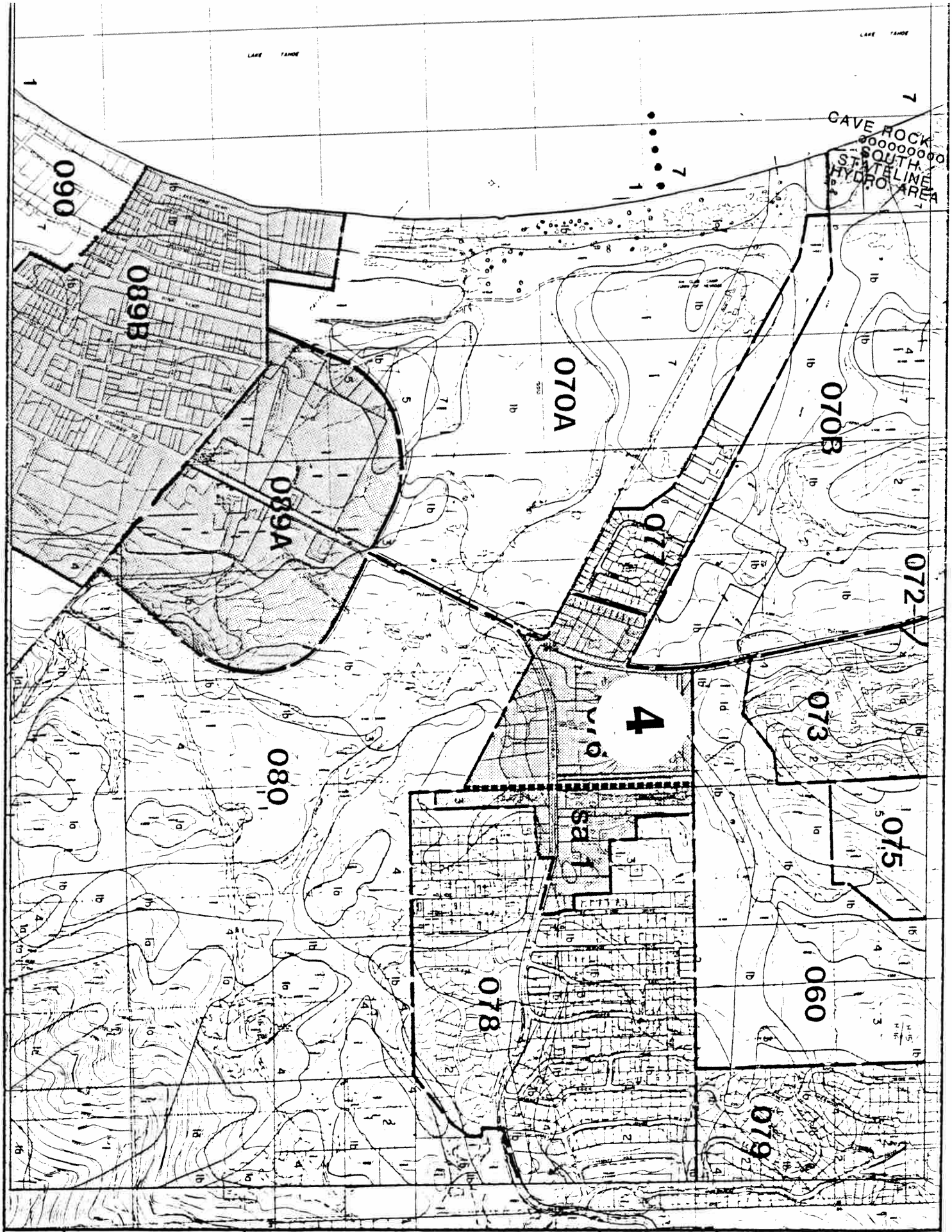
WATERSHED NAME (NUMBER): Burke Creek (66)

PRIORITY CATEGORY: Low

PROJECT LOCATION: Burke Creek Meadow is located east of Highway 50 and north of Kingsbury Grade in Douglas County along Burke Creek. Affected parcels include 07-050-02, 03, 05, 06. Land capability is 1b with Ev soil. Restorabe SEZ includes approximately 15 acres.

SITE DESCRIPTION/FIELD ANALYSIS: This natural meadow of approximately 15 acres is in relatively good condition. However, there is a jeep trail which follows Burke Creek through the meadow, and crosses the stream to access the meadow. Vehicle access to the meadow is unrestricted from both ends. The major disturbance is illegal ORV trespass through the meadow and channel.

RESTORATION POTENTIAL: Close access from both ends of meadow to ORV users. Tear up compacted areas and revegetate. Vegetation should be easily established once vehicle access to the meadow is prevented. Road closure, revegetation, roadside drainage, slope stabilization and revegetation should be installed in the subdivision immediately adjacent to the meadow.



H-16
476 D 580

KEY MAP

LAKE TAHOE REGION
STATELINE
DOUGLAS COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S. E. H.
DATE: October 1971

REVISION	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: S. E. Fork Burke Creek Subdivided Area

PROJECT NUMBER: PA 079

TRPA MAP: H-16

WATERSHED NAME (NUMBER): Burke Creek (66)

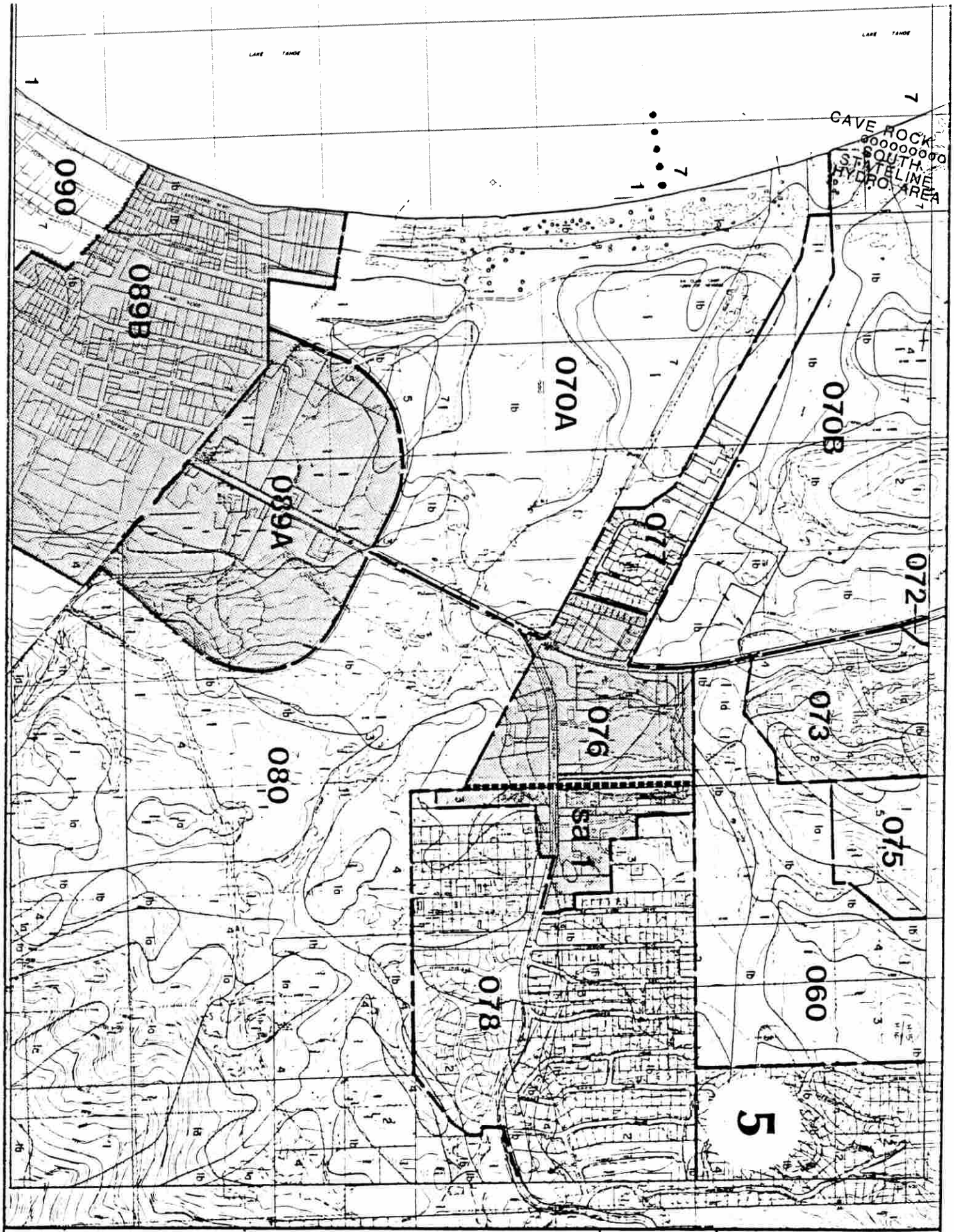
PRIORITY CATEGORY: Low

PROJECT LOCATION: The project site is located in the vicinity of Chimney Rock and Sherwood Streets, Chimney Rock estates off Kingsbury Grade in Douglas County.

SITE DESCRIPTION/FIELD ANALYSIS: The project site consists of approximately 5 acres of restorable SEZ in the Kingsbury Meadows area adjacent to the subdivision. Many residences in this built out subdivision are located within the stream channel. Unpaved USFS Road 13N82 is in the SEZ.

Road cuts and excavation have intercepted the ground water table. Residences encroach to stream banks. Lawns encroach to stream bed; fertilizer application is a problem. Vehicle access to the meadow is possible from several streets (Juniper, Meadow, Cottonwood). Vehicle access to unpaved USFS Road 13N82 is unrestricted at Ridge Drive.

RESTORATION POTENTIAL: Subdivision drainage improvements including rocklined trenches and mechanical slope stabilization should be installed. Several areas need storm drainage, energy dissipators, and roadside drainage. Vehicle access to the unpaved USFS road and Kingsbury Meadows should be restricted. Recontouring and revegetation of the USFS roads should be initiated.



H-16
476 D 580

KEY MAP

LAKE TAHOE REGION
STATELINE
DOUGLAS COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S.E.H.
DATE: October 1971

REVISION	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Andria Street Park and Uphill Seep

PROJECT NUMBER: PA 081N

TRPA MAP: I-15

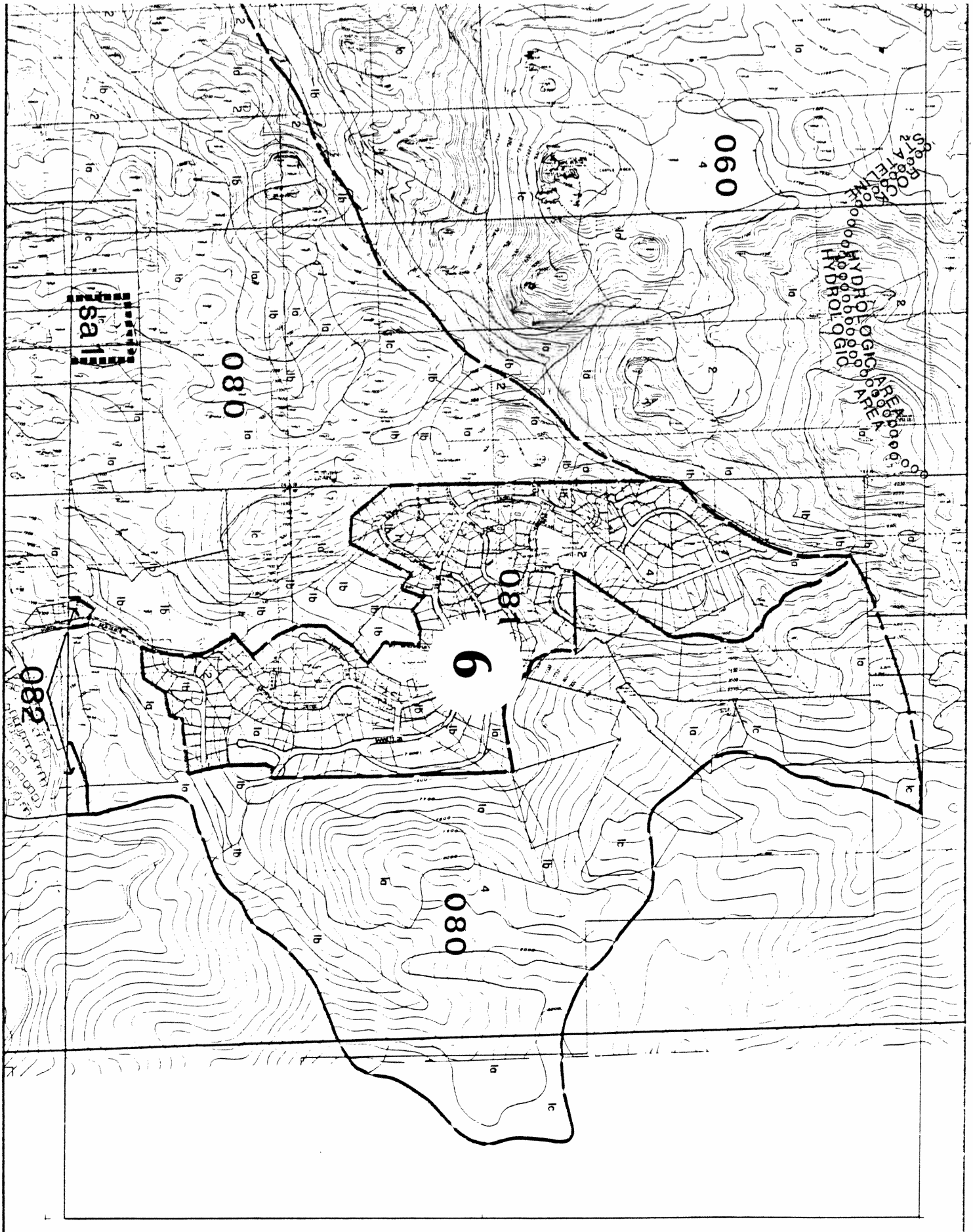
WATERSHED NAME (NUMBER): Edgewood Creek (68)

PRIORITY CATEGORY: Low

PROJECT LOCATION: Andria Street and Barrett Street off North Benjamin Drive in Kingsbury Village in Douglas County, Nevada. Affected properties include APN's 11-171-01, 02; 11-172-01; and residences on Barrett Street. Soil types consist of Ev, land capability 1b; and CaF, land capability 1a.

SITE DESCRIPTION/FIELD ANALYSIS: The project site consists of approximately 15 acres of stream environment zone and seeped soils. Approximately 5 acres (APN 11-171-02) have been filled with earth material to create a small ballpark and play area. Prior to deposition of fill material, the area was utilized as a swimming pond for local residents. Above Andria Way, a small natural spring feeds the stream. The area consists of seeped soils which have been disturbed by development. The placement of the subdivision has cut into seeped slopes on Barrett Drive above Andria Drive. There is inadequate roadside drainage to accommodate the seep interception; water flows uncontrolled along the streets. Several property owners have dug trenches along the roadside to allow for water movement. Extensive erosion is occurring on the uphill lots in the subdivision causing large amounts of sediment movement in the unlined drainage ditches. The large amount of fill material for the ballpark has caused channelization of the stream flow.

RESTORATION POTENTIAL: Subdivision drainage improvements including mechanical stabilization of cut banks and rock lined drainage trenches will greatly improve the water quality of the stream. Extensive slope stabilization and revegetation work is needed in this area to limit the amount of erosion. Storm and roadside drainage are needed to control runoff during peak periods.



I-15
484 D 592

KEY MAP

LAKE TAHOE REGION
CASTLE ROCK
DOUGLAS COUNTY, NEVADA
TAHOE REGIONAL PLANNING AGENCY

SCALE 1" = 400'
CHECKED BY
DATE

MARK	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Aspen Way Channel

PROJECT NUMBER: PA 081S

TRPA MAP: I-15

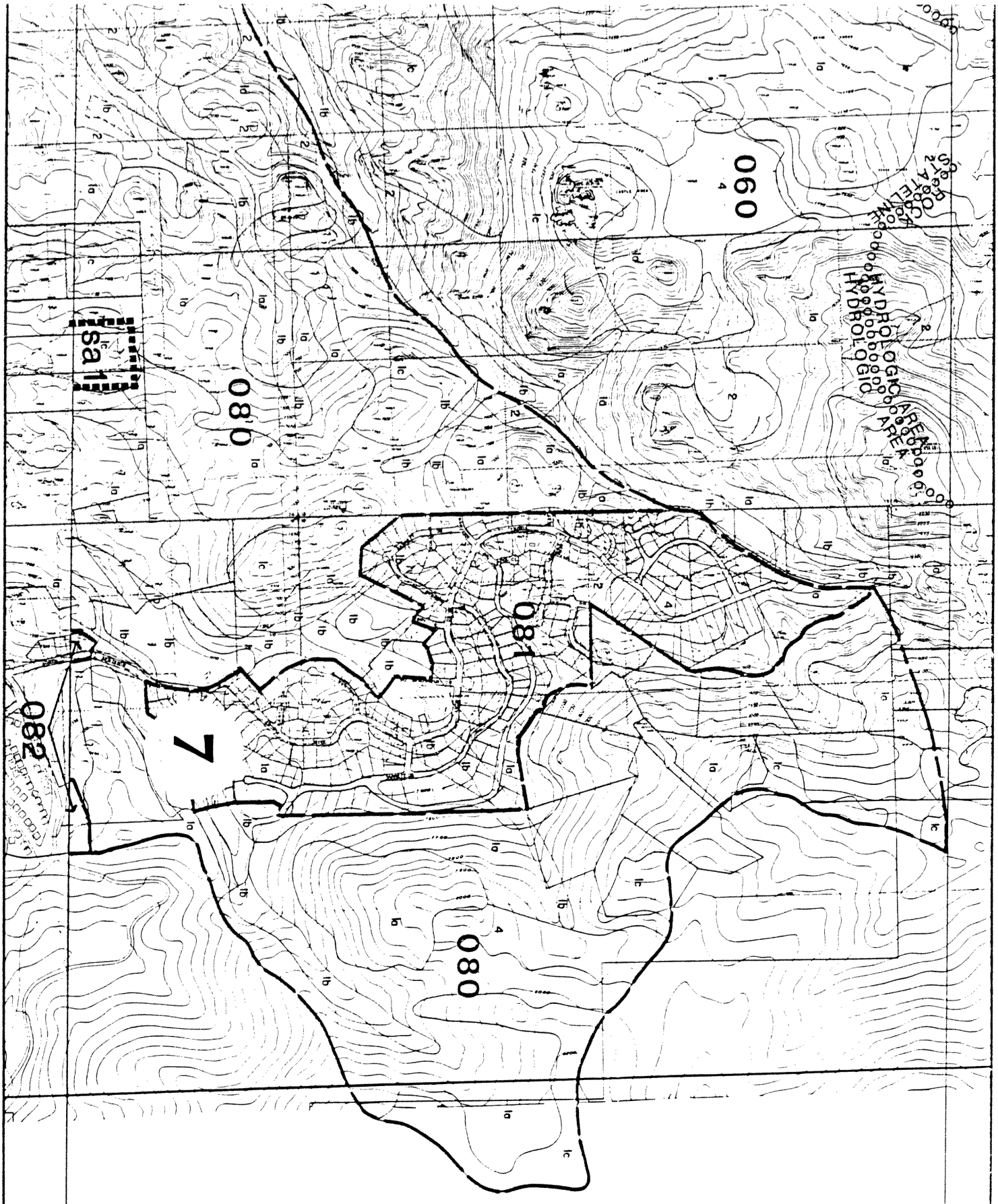
WATERSHED NAME (NUMBER): Edgewood Creek (68)

PRIORITY CATEGORY: Medium

PROJECT LOCATION: Aspen Way is located off North Benjamin in Kingsbury Village Drive in Douglas County. Affected properties include the residences along Aspen Way and the adjacent upstream parcel 11-070-07 and the adjacent downstream property across N. Benjamin (11-070-05). Soil types are Ev, land capability 1b, and CaE with streamzone (1b) land capability rating. There are approximately 10 acres of restorable SEZ in this project site.

SITE DESCRIPTION/FIELD ANALYSIS: Aspen Way Road sits in the stream channel; flow has been diverted to inadequate roadside drainage. Most properties along Aspen Way have been developed; some subdivision drainage improvements have been installed. Upstream a small check dam has been installed. Downstream a USFS unpaved road borders the stream. Rocklined roadside drainage has been installed, but is inadequate to meet the stream flow. A small gabion check dam has been installed upstream of the subdivision. Ponding and bank erosion have resulted from flow diversion to the roadside drainage through an undersized culvert. The upper portion of rocklined trenches are eroding away. Water flows freely at the base of Aspen Way into the cul-de-sac. Across N. Benjamin USFS unpaved road 13N82 parallels the stream. There is severe erosion and gullying on this road. Presently access is unrestricted to vehicles.

RESTORATION POTENTIAL: Extensive upstream stabilization work should be commenced. Further check dam work should be utilized to slow the stream flow and an adequate culvert should be installed to prevent ponding above the subdivision. Bankside erosion will have to be controlled. The unpaved USFS road should be closed to ORV use and evaluated as to need. Extensive storm drainage improvements should be installed above Aspen Way.



I-15
484 0 552

KEY MAP

LAKE TAHOE REGION

CASTLE ROCK

DOUGLAS COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'

CHECKED BY

DATE

DESCRIPTION	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Ansaldo Acres Back Meadow

PROJECT NUMBER: PA 082

TRPA MAP: I-16

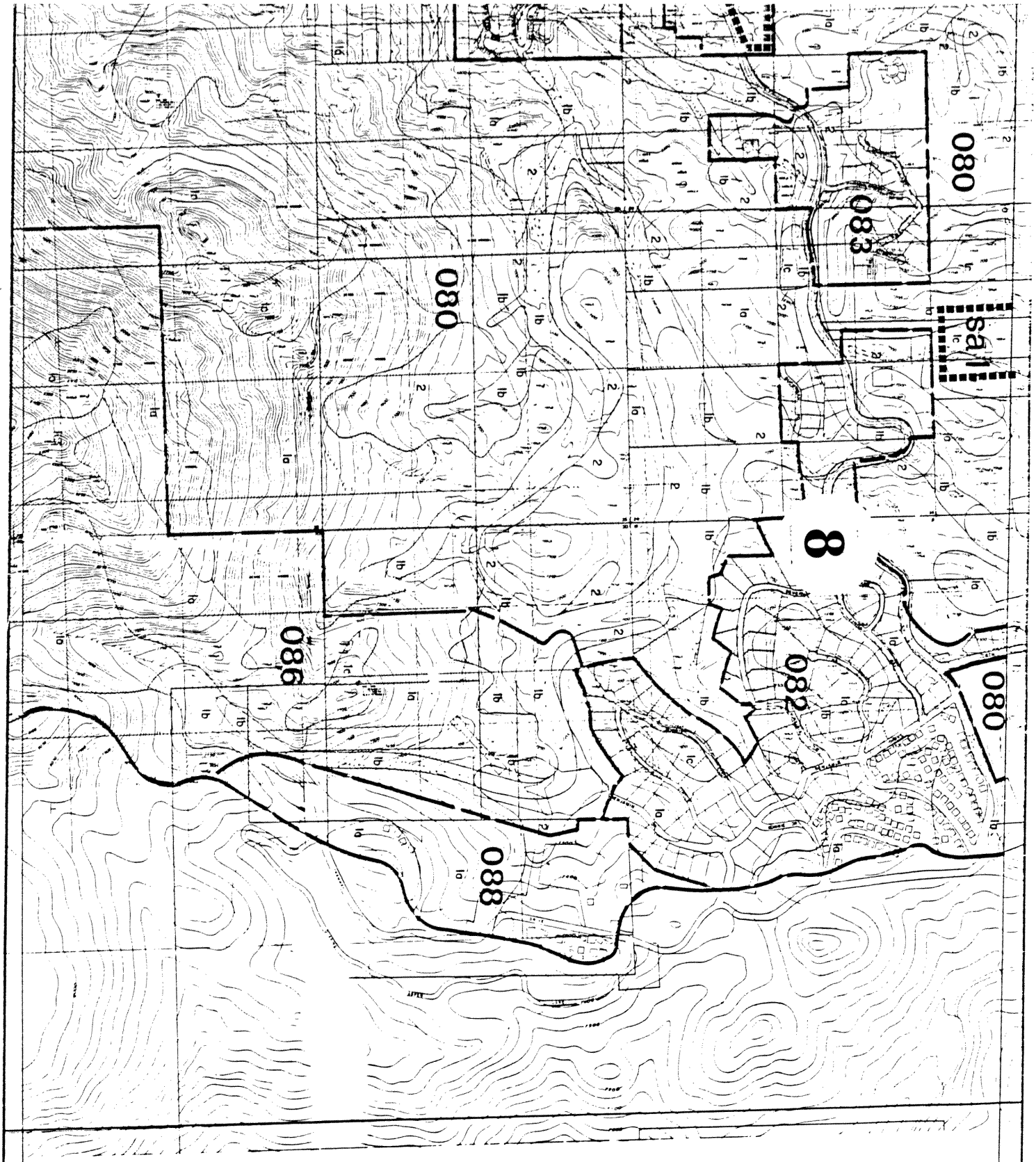
WATERSHED NAME (NUMBER): Edgewood Creek (68)

PRIORITY CATEGORY: Low

PROJECT LOCATION: This unpaved road is located off Linda Way at the top of Kingsbury Grade, Douglas County and joins the unpaved road at Buchannan. Soil type is Ev with a land capability rating of 1b. Approximate size of the project area is 10 acres.

SITE DESCRIPTION/FIELD ANALYSIS: This unpaved road built on fill material accesses a meadow and Edgewood Creek. The road crosses through the creekbed in several locations. Presently vehicle access is unrestricted. It is an unnecessary, unpaved roadway in a streamzone. It does not access any residences. There is extreme gullying in the road itself and it crosses through the streambed in several places. There is no restriction to vehicle access at Linda Way.

RESTORATION POTENTIAL: Vehicle access should be blocked. The road should be recontoured and revegetated. Bank stabilization of the streambed is necessary.



LAKE TAHOE REGION
KINGSBURY GRADE
DOUGLAS COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

I-16

476 D 592

KEY MAP

SCALE 1" = 400'

CHECKED BY:

DATE

NO.	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Edgewood Creek Road, Ansaldo Acres to Panorama Road

PROJECT NUMBER: PA 084

TRPA MAP: I-16

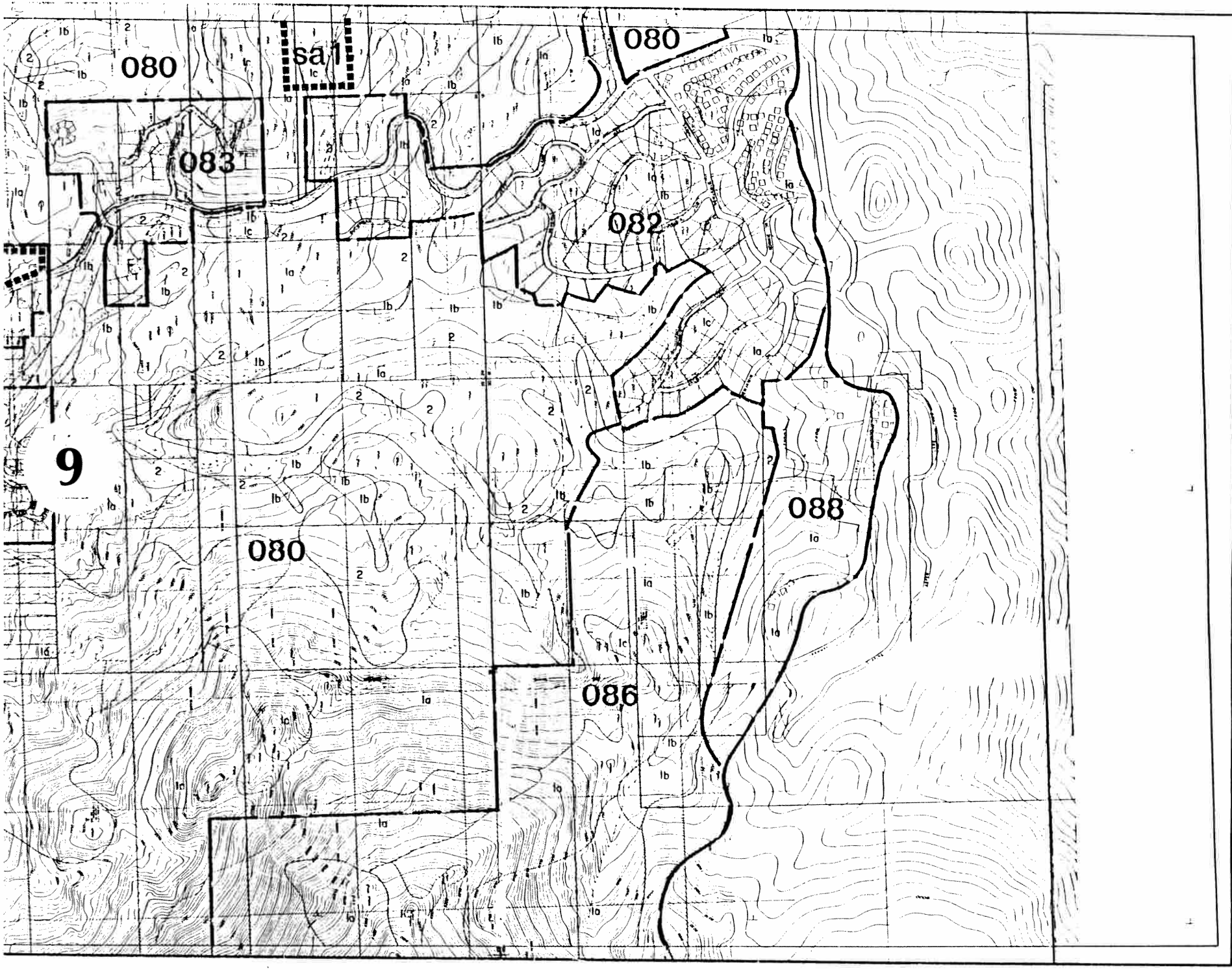
WATERSHED NAME (NUMBER): Edgewood Creek (68)

PRIORITY CATEGORY: Medium

PROJECT LOCATION: This unpaved road follows the middle fork of Edgewood Creek from Buchannan Street off Kingsbury Grade downstream to Panorama Road off Kingsbury Grade in Douglas County. The road covers approximately 2 miles immediately adjacent to Edgewood Creek. Soil type is Ev with a 1b land capability rating. Restorable SEZ is approximately 10 acres.

SITE DESCRIPTION/FIELD ANALYSIS: This is a private unpaved road which runs immediately adjacent to Edgewood Creek for its entire length. Access to the road is not restricted from either end. The road accesses only 2 homes within 1/4 mile of Panorama Road. The road bed itself is fairly stable. There are a few places where gullying has occurred. It is not a major contributor of sediment to Edgewood Creek; however, fill for the road channelizes the creek and restricts flooding.

RESTORATION POTENTIAL: Access should be blocked at the Buchannan Street end. The road should be recontoured and revegetated. The Panorama end of this road should also be blocked, recontoured and vegetated beyond the access to the 2 residences.



LAKE TAHOE REGION
KINGSBURY GRADE
DOUGLAS COUNTY, NEVADA

TAHOE REGIONAL PLANNING AGENCY

SCALE 1" = 400'
CHECKED BY
DATE

DESCRIPTION
DATE

KEY MAP

I-16

476 D 592

VIII. SEZ RESTORATION PROJECT DESCRIPTIONS

D. City of South Lake Tahoe, California

1. PA 085, 093: Charlesworth and Elva Streets
2. PA 092: Wildwood-Ski Run Boulevard
3. PA 093: Tamarack Avenue
4. PA 100: Truckee Marsh
5. PA 100S: Barton Meadow
6. PA 100N: Truckee Marsh
7. PA 100E: Trout Creek Meadow
8. PA 100SE: Trout Creek Meadow
9. PA 100, 103: Optimist Club
10. PA 110: Dunlap Drive
11. PA 110, 112: Fifth Street

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Charlesworth and Elva Street Subdivision

PROJECT NUMBER: PA 093, 085

TRPA MAP: H-17

WATERSHED NAME (NUMBER): Intervening Area Between Edgewood and Bijou Creeks (69)

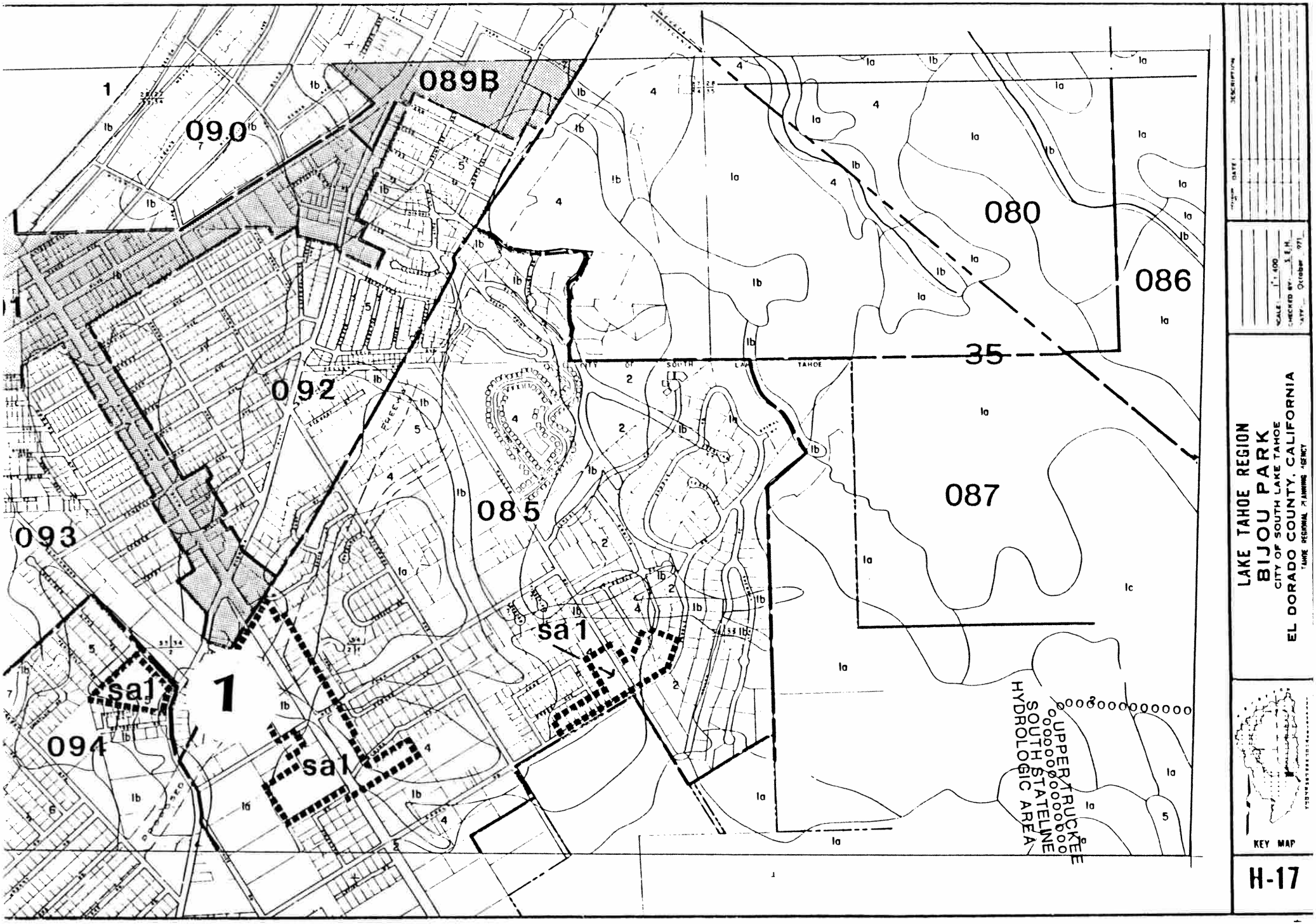
PRIORITY CATEGORY: Medium

PROJECT LOCATION: The project site is located off Pioneer Trail just west of Ski Run Boulevard in the City of South Lake Tahoe. Affected parcels include APN's 28-141-21 through -25, 28-141-33, 28-141-40, -42 and -43. The land capability is 1b with EV soil type.

SITE DESCRIPTION/FIELD ANALYSIS: The project site is characterized by approximately 10 acres of channelized meadow and very high groundwater table. Vegetation includes quaking aspen, meadow grasses, and willows. The Caltrans freeway right-of-way comprises approximately 50% of the project site. The existing subdivision was created with TRPA approval prior to the revision of the Compact. One single-family dwelling exists in the subdivision. The groundwater table of the area has been lowered by subdivision improvements. Charlesworth Court, built on fill material, intercepts the stream channel and the roadside drainage ditch drains the meadow. There is one developed lot in the subdivision (APN 28-14-142) which has an undersized culvert beneath the driveway causing ponding and downstream scour.

RESTORATION POTENTIAL: Restoration should include removal of that portion of Charlesworth Court beyond the existing dwelling. For the amount of restoration, little work is involved. Heavy equipment will be needed to remove the unnecessary road. The area should be revegetated with riparian species. Additional work would be required to stabilize culvert discharge points and stabilize areas that are head cutting. Storm drainage, energy dissipators at the corner of Needlepeak and Ski Run Boulevard should be installed as part of this restoration project.

IMPLEMENTATION: TDR, lot retirement, open space easement.



LAKE TAHOE REGION
BIJOU PARK
CITY OF SOUTH LAKE TAHOE
EL DORADO COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY

H-17

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Wildwood - Ski Run Boulevard

PROJECT NUMBER: PA 092

TRPA MAP: H-17

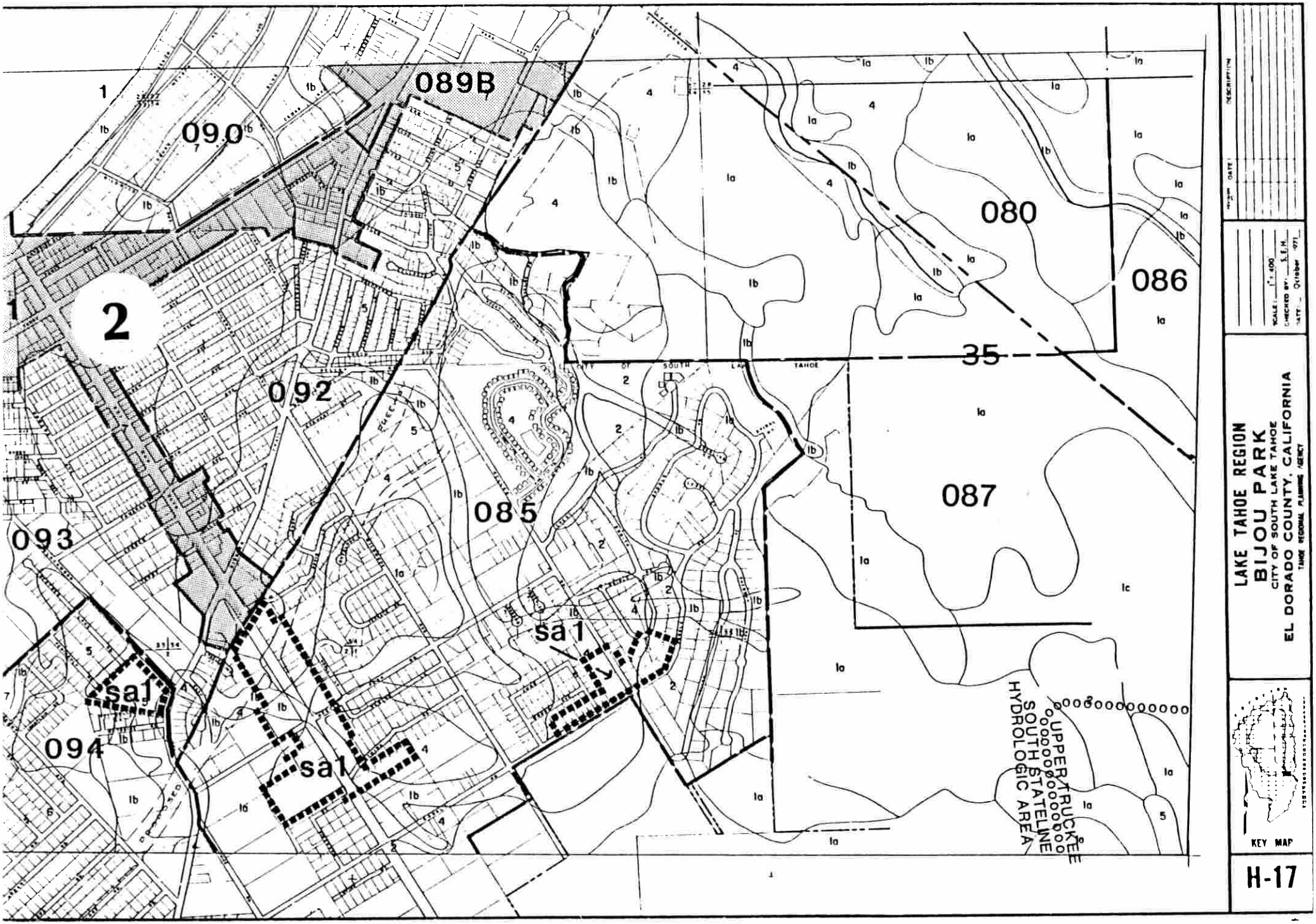
WATERSHED NAME (NUMBER): Intervening Area Between Edgewood and Bijou Creeks (69)

PRIORITY CATEGORY: Medium

PROJECT LOCATION: The project area consisting of approximately 5 acres encompasses the city block between Osgood, Ski Run Boulevard, Paradise and Sonora Avenues, in the City of South Lake Tahoe. Affected parcels include 27-071-01, 04, 05, 09, 11-17, 22, 23, 25, 26, 28. Land capability is: 1b with EV soil type.

SITE DESCRIPTION/FIELD ANALYSIS: The project site is characterized by a large meadow area severely compacted from parking for the commercial businesses along the highway. Destroyed vegetation and scattered debris are evident throughout the area. The affected parcels are unimproved.

RESTORATION POTENTIAL: This is a relatively small project site. Earthen fill material should be removed, roadside drainage improved, sedimentation basins and treatment facilities constructed and compacted areas revegetated. The site should be fenced to prevent a recurrence of parking and compaction. The Wildwood-Bijou erosion control program that the City of South Lake Tahoe has undertaken includes this area. Detailed field analysis and engineering work has been accomplished. Extensive storm drainage improvements are needed in this area.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UPPER TRUCKEE
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HYDROLOGIC AREA
LAKE TAHOE REGION
BIJOU PARK
CITY OF SOUTH LAKE TAHOE
EL DORADO COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY
KEY MAP
H-17

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Tamarack Avenue

PROJECT NUMBER: PA 093

TRPA MAP: H-17

WATERSHED NAME (NUMBER): Intervening Area Between Edgewood and Bijou Creeks (69)

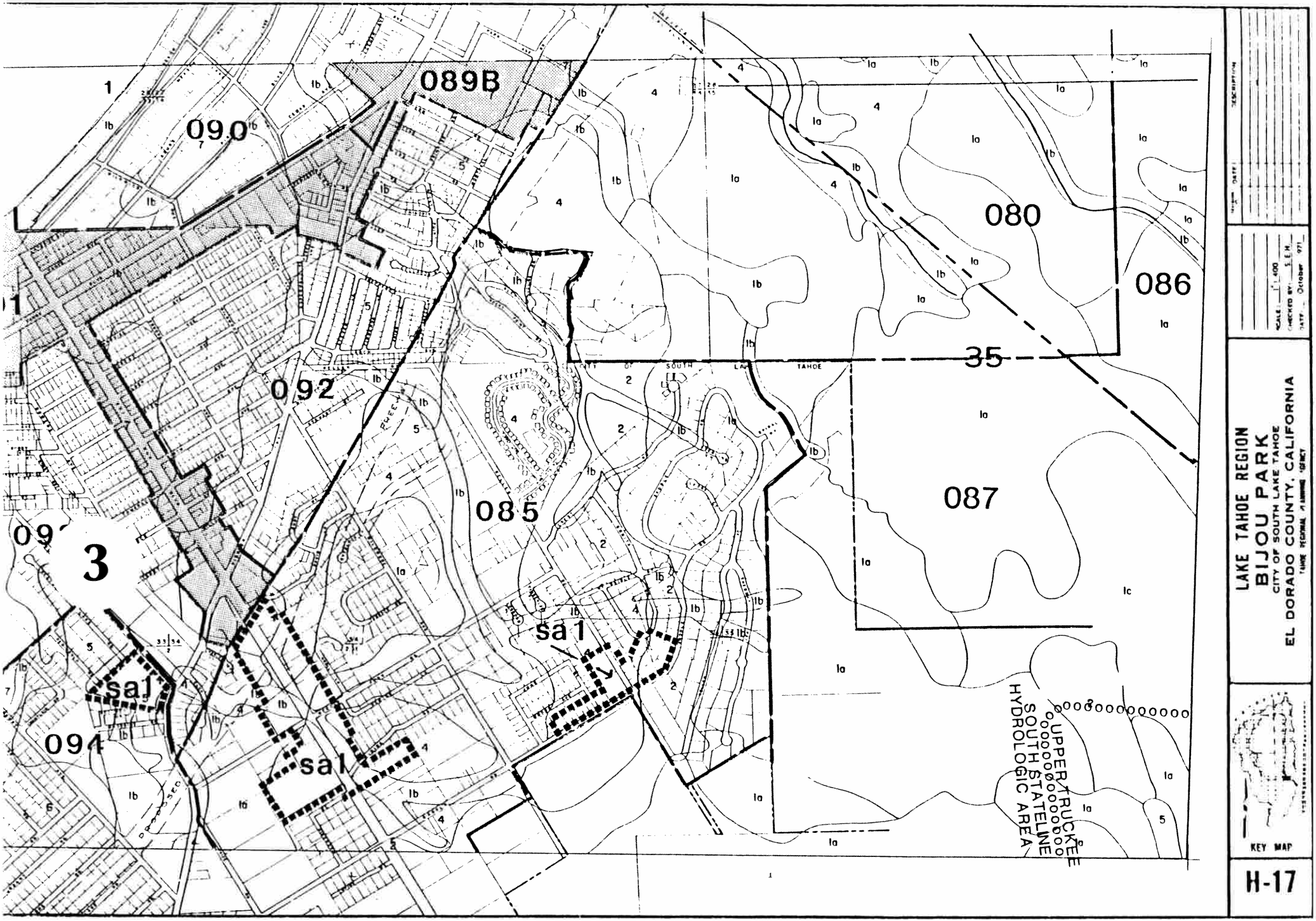
PRIORITY CATEGORY: Low

PROJECT LOCATION: The project site of approximately 1 acre is located off of Tamarack Avenue in the Ski Run area of the City of South Lake Tahoe. Affected parcel is 27-331-04, land capability 1b, and soil type EV.

SITE DESCRIPTION/FIELD ANALYSIS: The developed parcel which comprises the project area has been graded and compacted. There is little vegetation on the site and the surface water flow has been diverted to protect facilities. Although this parcel contains a single-family residence, the disturbance associated with the structure and the historic use of the parcel causes significant water quality impacts and creates a major break in a continuous functioning stream environment zone.

RESTORATION POTENTIAL: The best solution for restoration on this property would be removal of all improvements and major earth work to decompact the area. The area should then be revegetated with wetland indigious species. Adequate storm drainage should be incorporated into the project restoration.

IMPLEMENTATION: Lot retirement, transfer of coverage to a more suitable site.



LAKE TAHOE REGION
BIJOU PARK
CITY OF SOUTH LAKE TAHOE
EL DORADO COUNTY, CALIFORNIA

H-17

SEZ RESTORATION PROJECTS FOR MEADOW AREAS
SOUTH SHORE

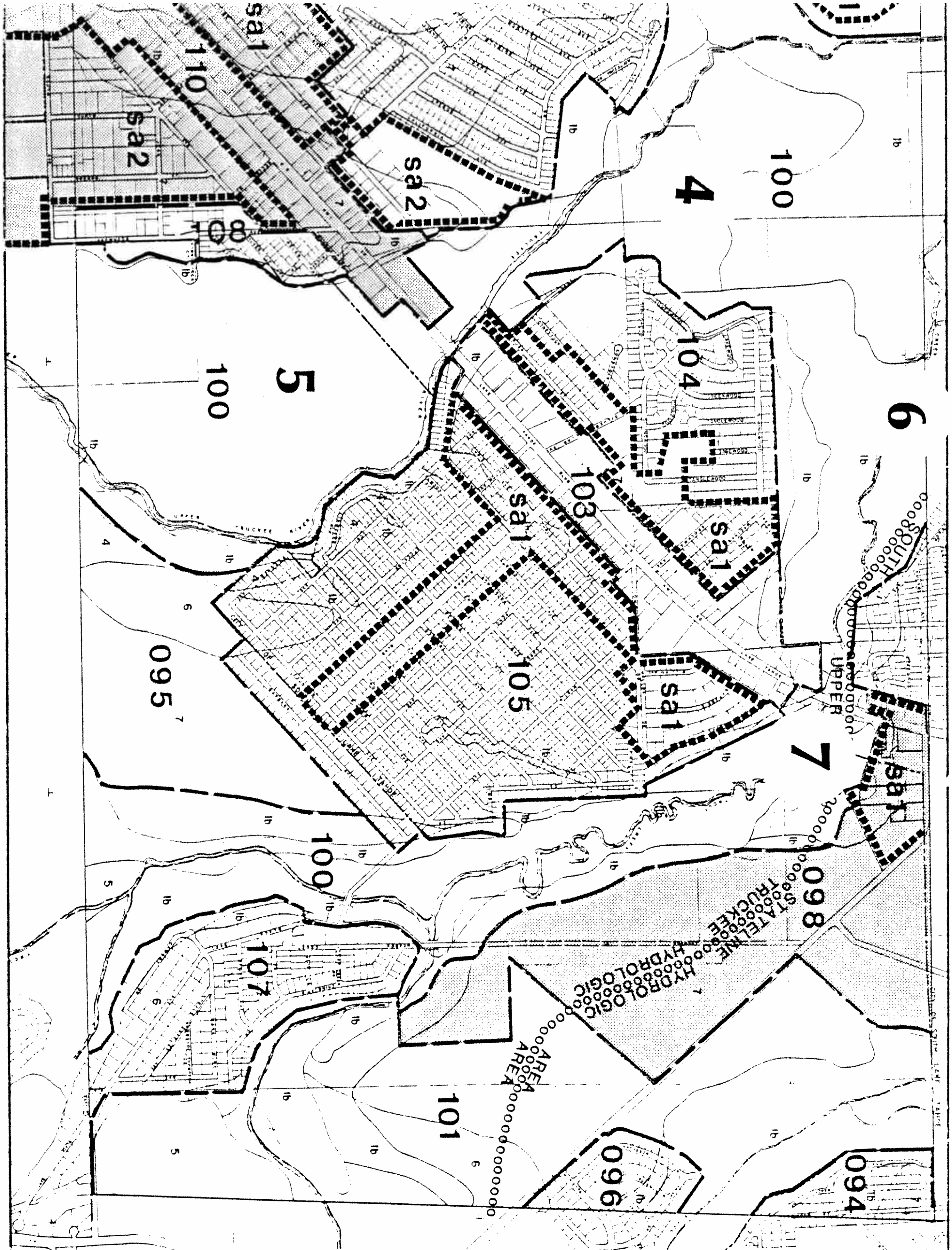
Several of the meadows in the Tahoe Basin exhibit signs of disturbance from livestock grazing. Overgrazing in SEZ's destroys vegetation, compacts the soil and decreases water quality. Streambank collapse and erosion is frequent since livestock have unrestricted access to streams (in most cases). The Upper Truckee River and Trout Creek meadows provide good examples of trampled streambanks and subsequent erosion. Fish habitat also suffers from overgrazing. Loss of riparian vegetation increases the temperature of the water and chance for bank collapse. Fencing portions of the stream to limit livestock access may be one solution to this problem. This would prevent unrestricted access and reduce streambank erosion along the channel. Installing low water crossings at locations of livestock use would protect the banks and channel bottom. Livestock should not be allowed on the meadows until they are dry. Disturbance of meadows in a saturated condtiion will create severe soil and water quality problems.

4. PA 100 - Truckee Marsh, Eloise and James Avenues crossing Tahoe Keys Boulevard to meadow. Portions of this meadow have received excessive fill for the Keys development. Single-family dwellings encroach SEZ throughout the subdivision. Priority Category: High.

5. PA 100S - Truckee Marsh, Barton Meadow. Soil compaction, vegetation destruction and streambank erosion are all evident at this meadow. Livestock grazing has occurred on this meadow for some time. Priority Category: High.

6. PA 100N - Truckee Marsh, Trout Creek Meadow, along edge of Al Tahoe Subdivision. Overgrazing of this meadow has resulted in vegetation destruction, severe soil compaction and stream channelization. Streambank slumping and erosion is evident. Livestock causes the greatest impact at this meadow since it is saturated much of the year. The livestock should not be allowed on the meadow until it is dry. Upstream fill and impervious surfaces have also added to the deterioration of the meadow. Priority Category: Medium.

7. PA 100E - Trout Creek Meadow, east side of Sierra Tract and Highway 50 corridor. Development along this stretch of Highway 50 has seriously altered Trout Creek Meadow. Fill has been placed in meadow for development of Meeks Lumber and Luthern Church. The auto wrecking yard adjacent to the meadow is unsightly and probably contributes toxic discharges. Livestock have also been grazing on the meadow. Priority Category: High.



LAKE TAHOE REGION
SOUTH LAKE TAHOE
CITY OF SOUTH LAKE TAHOE
EL DORADO COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY

SCALE 1" = 400
CHECKED BY S.E.H.
DATE October 1971

DATE | DESCRIPTION

KEY MAP

G-18
480 D 568

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Trout Creek Meadow (Downstream of Pioneer Trail)

PROJECT NUMBER: PA 100SE

TRPA MAP: G-19

WATERSHED NAME (NUMBER): Trout Creek (72)

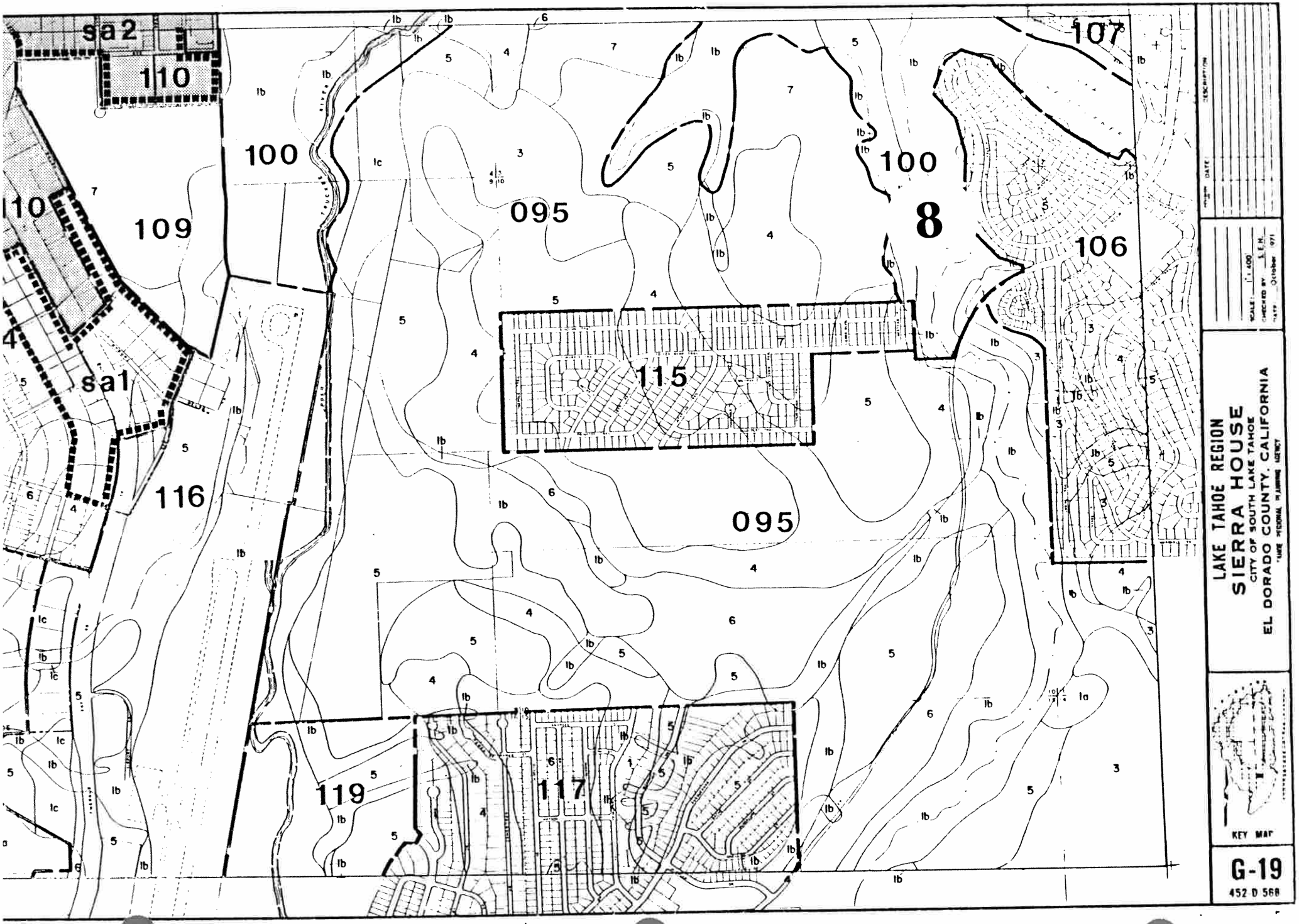
PRIORITY CATEGORY: Medium

PROJECT LOCATION: The project site of approximately 15 acres is located at the crossing of Trout Creek and Pioneer Trail and the Montgomery Estates subdivision along the meadow in El Dorado County.

SITE DESCRIPTION/FIELD ANALYSIS: The meadow is in relatively good condition although Trout Creek is highly channelized. Properties along Plateau Circle in Montgomery Estates are encroaching into the meadow. Cougar Trial cul-de-sac presently does not access any residences.

Compaction and vegetation removal in the meadow have occurred as a result of animal over-grazing. Trout Creek is highly channelized; bankside erosion is evident. Culvert under Pioneer Trail should be evaluated to determine if adequate for peak stream flow.

RESTORATION POTENTIAL: Animal grazing in the meadow should be evaluated to determine optimal number. Bankside stabilization of Trout Creek is necessary. BMP's should be installed on all developed properties and yard encroachment into the meadow should be curtailed. Cougar Trail cul-de-sac should be removed and revegetated.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LAKE TAHOE REGION
SIERRA HOUSE
CITY OF SOUTH LAKE TAHOE
EL DORADO COUNTY, CALIFORNIA
KEY MAP
G-19
452 D 568

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Optimist Club, Trailer Pad

PROJECT NUMBER: PA 100, 103

TRPA MAP: G-18

WATERSHED NAME (NUMBER): Trout Creek (8)

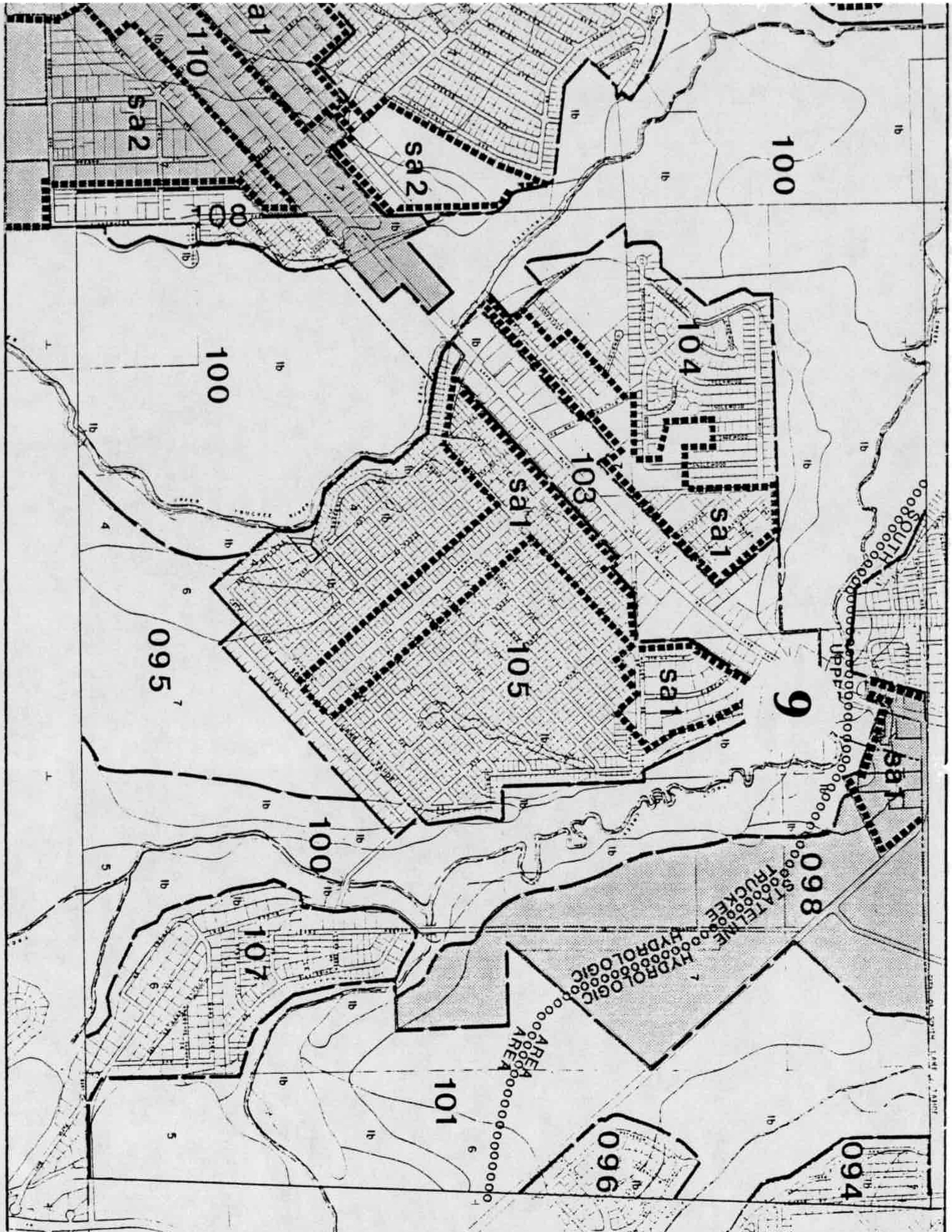
PRIORITY CATEGORY: Medium

PROJECT LOCATION: The trailer pad is located along Highway 50 and Blue Lake Road next to the Muffler Shop. The affected parcel is APN 31-103-12. The land capability of the subject property is 1b (EV soil).

SITE DESCRIPTION/FIELD ANALYSIS: The area consists of approximately 20,000 square feet (one-half acre) of stream environment zone which was filled with earth material. Prior to deposition of the fill, the area contained riparian vegetation and was considered to be within the 100 year floodplain. The site currently is highly compacted, unpaved and stripped of vegetation. There are no drainage or infiltration facilities on-site.

Although it appears to be a minor encroachment, the visible nature of the site and the downstream impacts from the fill are considerable. During peak flood stages, the entire area displaces flood waters and reduces the meadow's treatment capacity.

RESTORATION POTENTIAL: Restoration of the area would be relatively expensive in comparison to the amount of increased capacity received. The high cost is due to the expense necessary to remove the deposited fill material. Once the fill material is removed and the finish grade set equal to that of the meadow, the area should be revegetated with riparian species. Storm drainage, energy dissipators and roadside drainage should be incorporated into this project area. As stated above, this is a highly visible project due to its location on Highway 50.



G-18
460 D 568

KEY MAP

LAKE TAHOE REGION
SOUTH LAKE TAHOE
CITY OF SOUTH LAKE TAHOE
EL DORADO COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Dunlap Drive

PROJECT NUMBER: PA 110

TRPA MAP: F-18

WATERSHED NAME (NUMBER): Upper Truckee River (74)

PRIORITY CATEGORY: Medium

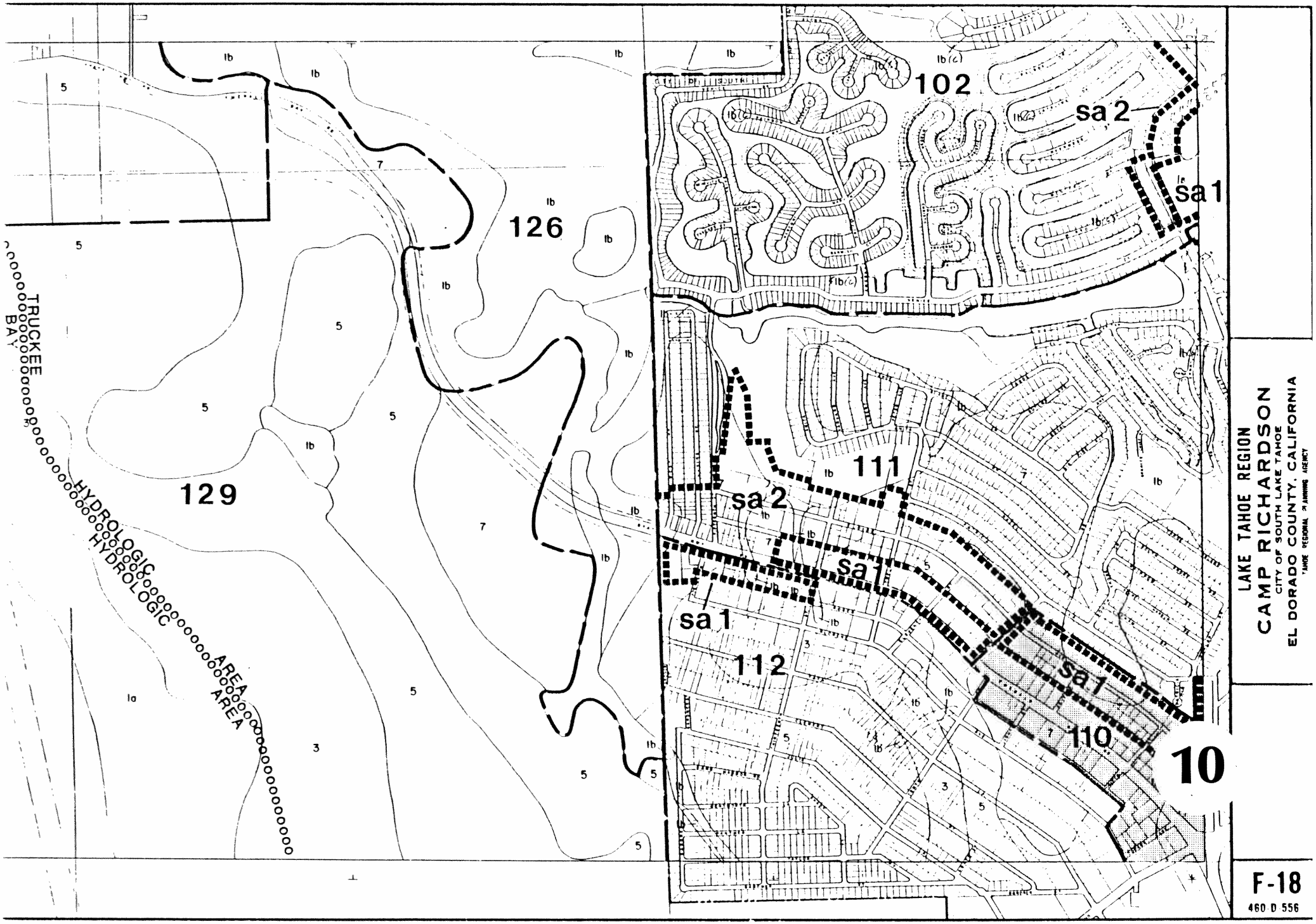
PROJECT LOCATION: The project site of approximately 10 acres is located in the vicinity of Dunlap Drive south of Tahoe Valley School in the "Y" area, City of South Lake Tahoe.

SITE DESCRIPTION/FIELD ANALYSIS: The area is approximately 80% built out with single family homes and some commercial development. Homes along Dunlap Drive encroach to the stream bank, and flow has been culvertized in several locations for road placement. An unpaved road crosses the meadow to join Washington Street to the commercial end of Dunlap Drive.

The stream is highly disturbed in this project area. Homes, yards, and fencing encroach directly to the streambed. Road placement intercepts the stream in several areas, and culverts are not adequate for peak flow. Bankside erosion is evident throughout the project site. Extensive compaction is evident on the unpaved road which encroaches into the SEZ transition zone to connect Dunlap and Washington. Debris is scattered through the project site.

The entire channel is diverted around the Sierra Pacific Power Plant in a cement culvert. Several auto body shops are located in SEZ; there is a possible toxic discharge. The site is overcovered with impervious surface throughout the commercial area.

RESTORATION POTENTIAL: Roadside drainage and culverts should be sized to meet peak stream flow. Stream banks should be stabilized. Existing culverts should be rock lined. Excessive impervious coverage should be removed in commercial areas and BMP's installed throughout the entire area. The unpaved road should be ripped up, revegetated, and fenced to prevent further compaction. Storm drainage improvements are necessary to accommodate peak spring runoff flow.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TRUCKEE BAY
HYDROLOGIC AREA
HYDROLOGIC AREA
LAKE TAHOE REGION
CAMP RICHARDSON
CITY OF SOUTH LAKE TAHOE
EL DORADO COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY
F-18
460 D 556

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Fifth Street

PROJECT NUMBER: PA 112, 110

TRPA MAP: F-18

WATERSHED NAME (NUMBER): Upper Truckee River (73)

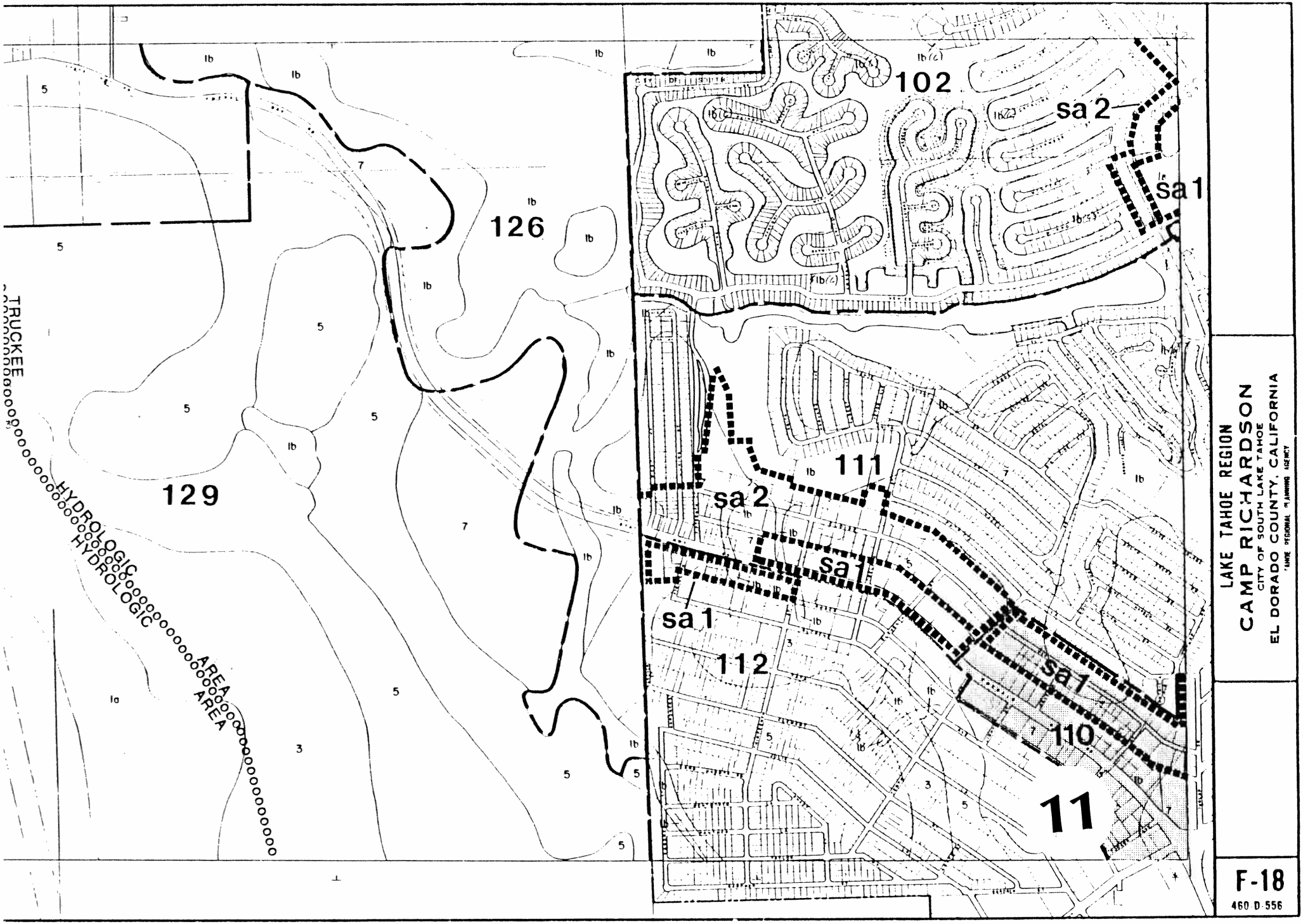
PRIORITY CATEGORY: Low

PROJECT LOCATION: The project site of approximately 10 acres is bound by Highway 89, Lake Tahoe Boulevard, Fifth Street and Tata Lane near the "Y" in South Lake Tahoe. The soil type of the area is Ev (1b) and is classified SEZ.

FIELD ANALYSIS: The SEZ has been highly disturbed due to development. Although most of the project site is developed with a housing tract there are several vacant properties located throughout the area. Drainage facilities are non-existent and several driveways should be paved. A tire storage yard located in the project area may be leaking toxics into the high groundwater table.

RESTORATION POTENTIAL: Restoration of the project area should include roadside and storm drainage improvements, BMP's of individual properties including paving of parking areas and revegetation of disturbed areas. Unpaved roads should be removed or paved according to 208 standards. The tire storage yard should be relocated outside of the SEZ. Additional storm drainage and roadside drainage are needed in this project site.

IMPLEMENTATION: Voluntary action plan and BMP compliance according to Regional Plan. Transfer of development rights and open space easements are possible alternatives for vacant properties.



LAKE TAHOE REGION
CAMP RICHARDSON
CITY OF SOUTH LAKE TAHOE
EL DORADO COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY

F-18
460 D 556

VIII. SEZ RESTORATION PROJECT DESCRIPTIONS

E. El Dorado County, California

1. PA 106W, Cold Creek
2. PA 106E: Ravine Street
3. PA 118: Sawmill Pond
4. PA 119S: Upper Truckee River
5. PA 119N: Upper Truckee River
6. PA 119S: Boca Raton Drive
7. PA 119T: Elks Club Drive
8. PA 123, 125: Santa Fe Road
9. PA 132: Angora Creek Drive

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Cold Creek - Upstream of Lake Christopher

PROJECT NUMBER: PA 106W

TRPA MAP: H-19

WATERSHED NAME (NUMBER): Cold Creek (72)

PRIORITY CATEGORY: Medium

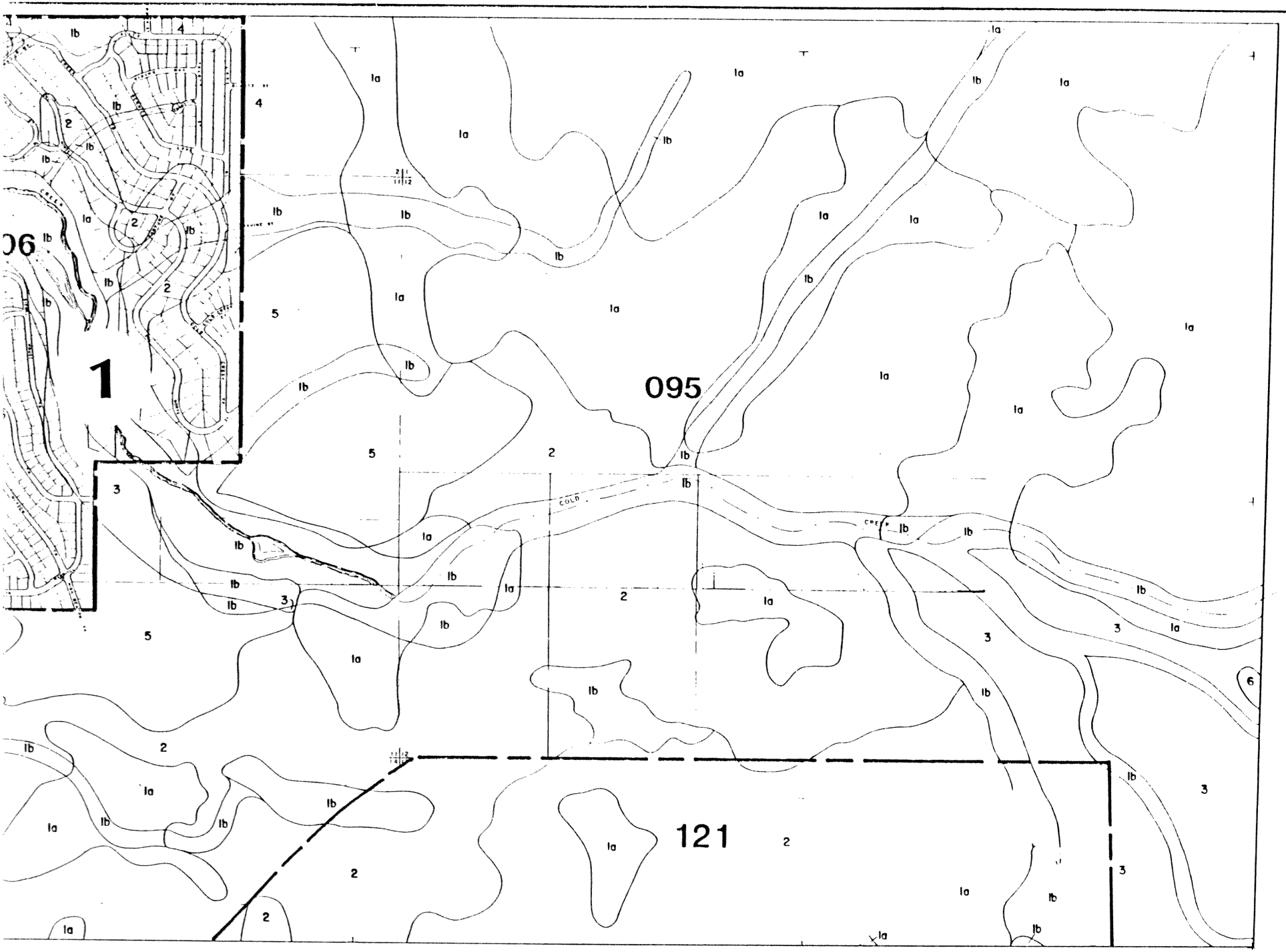
PROJECT LOCATION: The project site of approximately 20 acres encompasses the area upstream of Lake Christopher across Pioneer Trail in El Dorado County.

SITE DESCRIPTION/FIELD ANALYSIS: The STPUD water supply facility sits directly in the stream zone. Roadside stabilization, including rock lined drainage trenches, are in place on Pioneer Trail. There is evidence of bank stabilization and previous restoration work in the STPUD plant area (Cold Creek Erosion Control Project). STPUD has utilized a paved road situated directly in the stream zone to access the reservoir.

Although most of the mechanical treatments have been effective, the revegetation efforts have failed on some sites. The paved road along Cold Creek should be stabilized, revegetated and culverts rocklined. Presently, culverts are not rocklined, adding to bankside erosion.

RESTORATION POTENTIAL: This area is necessary for STPUD plant operations. Removal of the plant and road is not feasible. However, installation of BMP's, mechanical slope stabilization and revegetation could decrease the impacts of this use in the stream zone.

UPDATE: South Tahoe PUD has scheduled a project for 1989.



LAKE TAHOE REGION
COLD CREEK
EL DORADO COUNTY, CALIFORNIA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'
CHECKED BY: S.E.M.
DATE: OCTOBER 1971

DESCRIPTION

KEY MAP

H-19
452 D 580

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Ravine Street

PROJECT NUMBER: PA 106E

TRPA MAP: H-19

WATERSHED NAME (NUMBER): Cold Creek (72)

PRIORITY CATEGORY: Medium

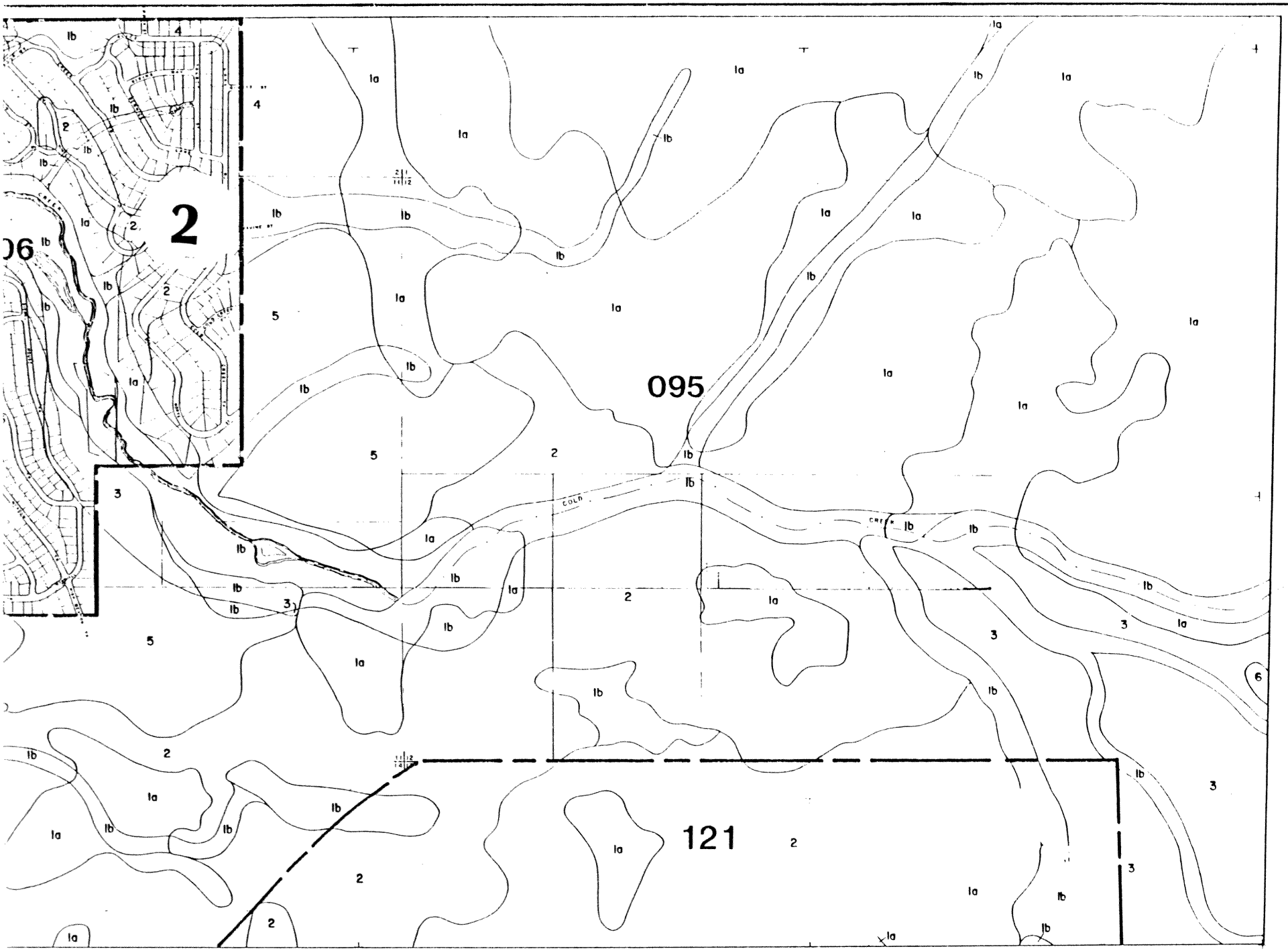
PROJECT LOCATION: The project site of approximately 5 acres is located in Montgomery Estates off Cold Creek Trail south of Pioneer Trail in El Dorado County.

SITE DESCRIPTION/FIELD ANALYSIS: Ravine Street , a paved cul-de-sac, situated directly in the stream channel, presently does not access any residences. An unpaved street continues from the end of the cul-de-sac up a steep slope. There are also approximately 10 vacant parcels in the project area along Cold Creek and Fortune Way.

Riparian vegetation is present throughout the project area. The unpaved portion of Ravine Street is severely gullied. The stream channel is diverted around Ravine Street and flows into a culvert under Cold Creek Trail. Channelization and bankside erosion are evident downstream of Fortune Way. Several yards encroach into the SEZ from Fortune and Del Norte Streets.

RESTORATION POTENTIAL: Ravine Street, both the paved and unpaved portions, should be removed, fenced and revegetated with riparian species. The culvert under cold creek should be modified to accommodate peak stream flow. BMP's should be installed on all developed properties in the SEZ and yard encroachment should be curtailed.

UPDATE: Ravine Street pavement (approximately 4000 square feet) will be removed as part of El Dorado County's 1988 Montgomery Estates Erosion Control Project.



LAKE TAHOE REGION
COLD CREEK
EL DORADO COUNTY, CALIFORNIA

SCALE: 1" = 400'
CHECKED BY: S.E.M.
DATE: October 1971

KEY MAP

H-19
452 D-580

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Sawmill Pond

PROJECT NUMBER: PA 118

TRPA MAP: F-20

WATERSHED NAME (NUMBER): Upper Truckee River (73)

PRIORITY CATEGORY: Medium

PROJECT LOCATION: The project site, APN 33-010-19, consisting of approximately 50 acres was purchased by the USFS. It is located on the northeast corner of Sawmill Road at the intersection of Lake Tahoe Boulevard and Sawmill Road.

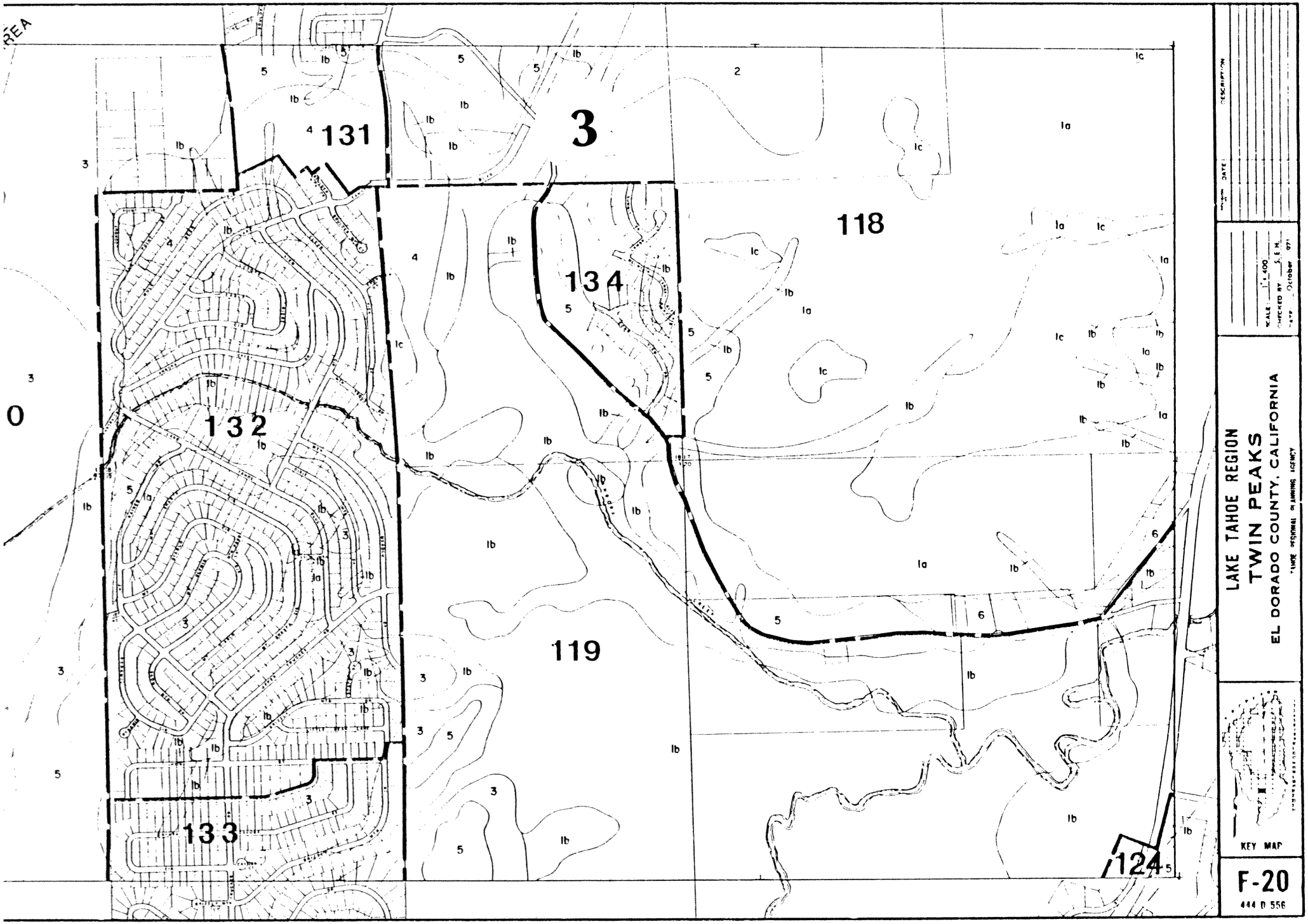
SITE DESCRIPTION: Sawmill Pond was a heavily used area by ORV's. The ORV use caused extensive compaction and disturbance of the vegetation. The site was littered, culverts were jammed and generally the area was in poor condition.

FIELD ANALYSIS: Gully erosion has occurred along the banks of the pond due to inadequate drainage from road. Culverts draining Lake Tahoe Boulevard into Sawmill pond protrude and are not rocklined. No vegetation exists on the road side of the pond due to fill material. Uncontrolled ORV use in the area has denuded vegetation. Piles of fill debris surround the pond.

RESTORATION POTENTIAL: Restoration of this site could be relatively easy. Culverts draining road should be rock lined. ORV use could be curtailed by fencing. Extensive use of the area will most likely continue. It may be possible to use this highly visible area for public awareness of natural processes and historical significance. High use of the area could continue with less impact if the area were fenced. revegetated and maintained. The site should be brought up to 208 water quality standards. Revegetation of ORV roads and roadside drainage are needed in this area.

UPDATE: The USFS has restored the entire project site. They have revegetated all disturbed areas including the ORV road, stabilized the banks of the pond, paved a parking area for use by the public and have closed access to the pond from the street.

SEZ ACREAGE RESTORED: 20 acres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LAKE TAHOE REGION
TWIN PEAKS
EL DORADO COUNTY, CALIFORNIA
TAHOE REGIONAL PLANNING AGENCY
SCALE 1"=400'
CHECKED BY S.E.M.
DATE October 1971
DESCRIPTION
DATE
KEY MAP
F-20
444 D 556

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Upper Truckee River at Tahoe Paradise Homeowners Park

PROJECT NUMBER: PA 119S

TRPA MAP: F-21

WATERSHED NAME (NUMBER): Upper Truckee River (73)

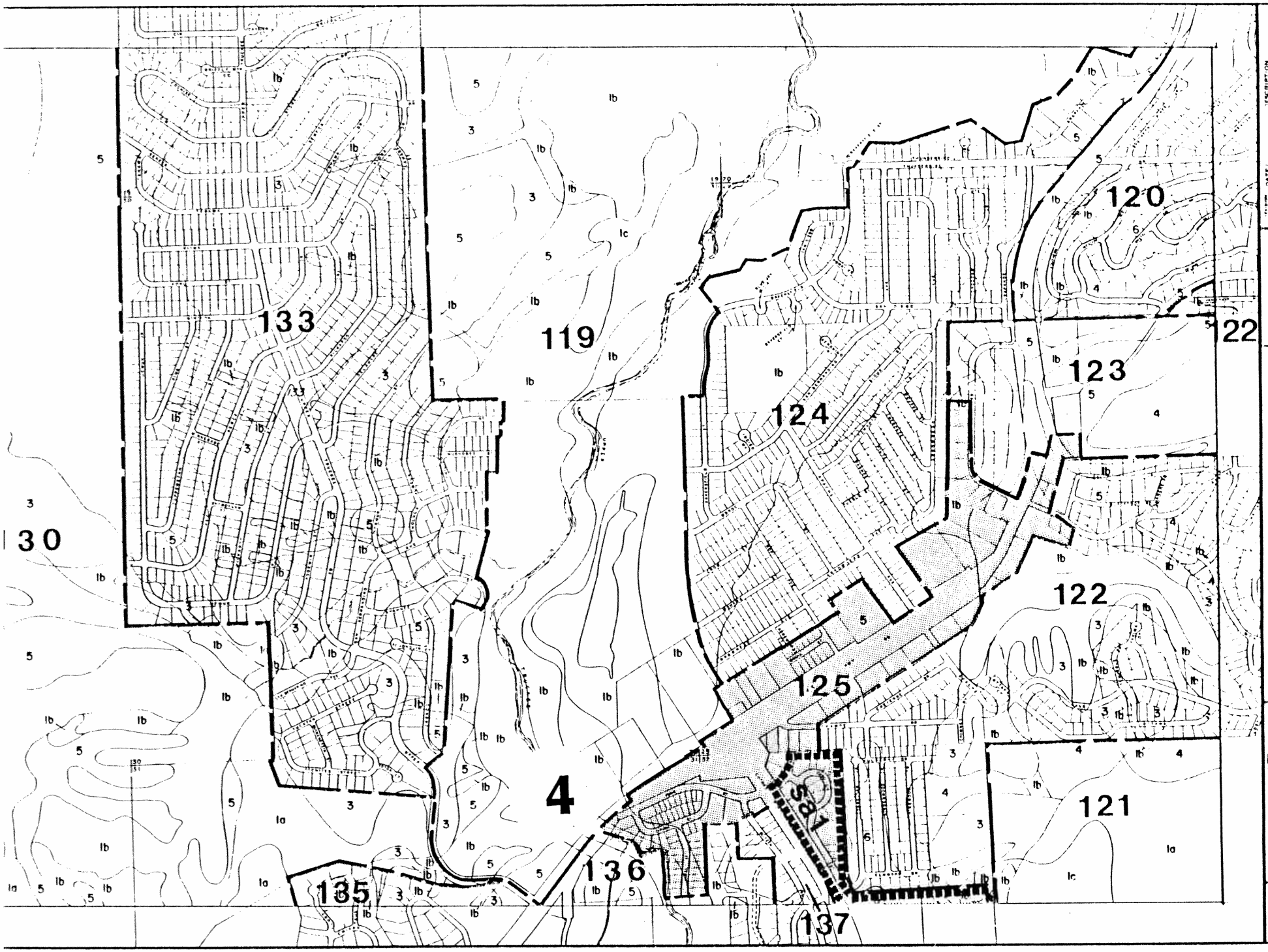
PRIORITY CATEGORY High

PROJECT LOCATION: The project site, consisting of approximately 15 acres is located immediately adjacent to the Upper Truckee River and is accessed from Highway 50 near the bridge crossing at North Upper Truckee Road. Affected properties include 34-020-31 and 32.

SITE DESCRIPTION/FIELD ANALYSIS: Vehicle access to the Upper Truckee is unrestricted. A series of roads created by ORV use have disturbed the riparian vegetation along the entire stretch of the river. ORV tracks are evident on the gravel bars in the stream. Severe bankside erosion of the Upper Truckee is evident in the project area.

RESTORATION POTENTIAL: Restriction of vehicle access by fencing would be the first step in restoring this area. The compacted roads should be restored and revegetated with riparian species.

UPDATE: Restoration project is scheduled for 1988 which consists of river bank stabilization and restriction of vehicle access where feasible.



LAKE TAHOE REGION

MEYERS

EL DORADO COUNTY, CALIFORNIA

*LAKE TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'

CHECKED BY: S.E.M.

DATE: OCTOBER 1971

DESCRIPTION

DATE

KEY MAP

F-21

436 D 556

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Upper Truckee River at Chilcothe Street (Upper Truckee Subdivision)

PROJECT NUMBER: PA 119N

TRPA MAP: 4-21

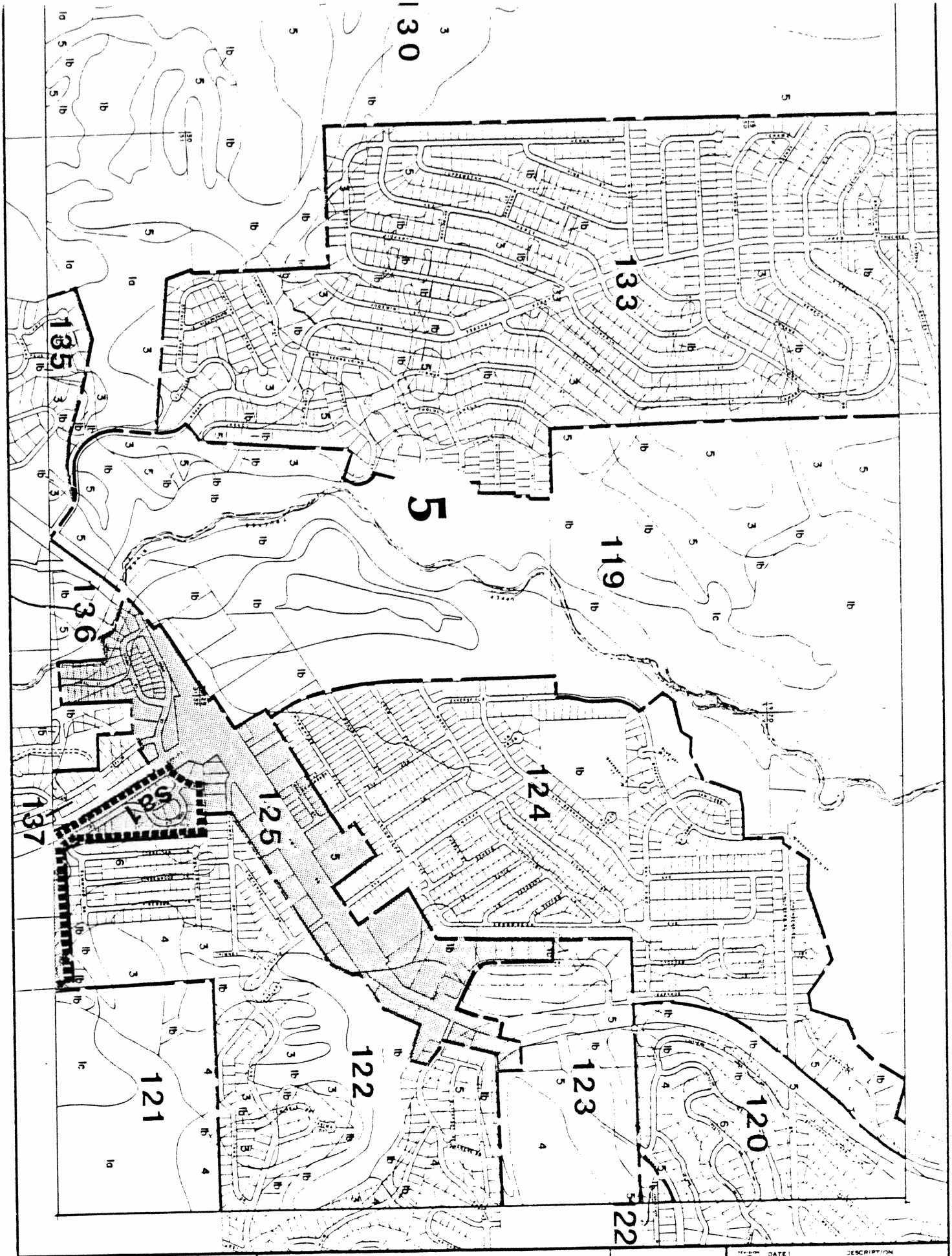
WATERSHED NAME (NUMBER): Upper Truckee River (73)

PRIORITY CATEGORY: High

PROJECT LOCATION: The project site, consisting of approximately 20 acres of unpaved and unmaintained roads, is located immediately adjacent to the Upper Truckee River and is accessed from Chilcothe, Mushogee, and Cholula Avenues. Affected properties, APN's 34-020-12, 34-010-18, and 34-010-20, are vacant with a land capability rating of 1b with Co soil type.

PROJECT DESCRIPTION/FIELD ANALYSIS: The unpaved roads which comprise this project site are accessed by subdivision streets of Chilcothe, Mushogee and Cholula. These streets provide unrestricted access to the Upper Truckee for any type of vehicle. Tracks can be seen in gravel bars in the stream. Riparian vegetation is evident through the project site; roads are compacted and gullying is evident.

RESTORATION POTENTIAL: Vehicle access to the river can be prevented with fencing and revegetation of the unpaved roads. Revegetation of the roads and storm drainage improvements are needed.



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KEY MAP

LAKE TAHOE REGION

MEYERS

EL DORADO COUNTY, CALIFORNIA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'

CHECKED BY: S.E.H.

DATE: October 971

NO.	DATE	DESCRIPTION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Boca Raton Drive/Elks Club Area

PROJECT NUMBER: PA 119S

TRPA MAP: G-20

WATERSHED NAME (NUMBER): Upper Truckee River (73B)

PRIORITY CATEGORY: High

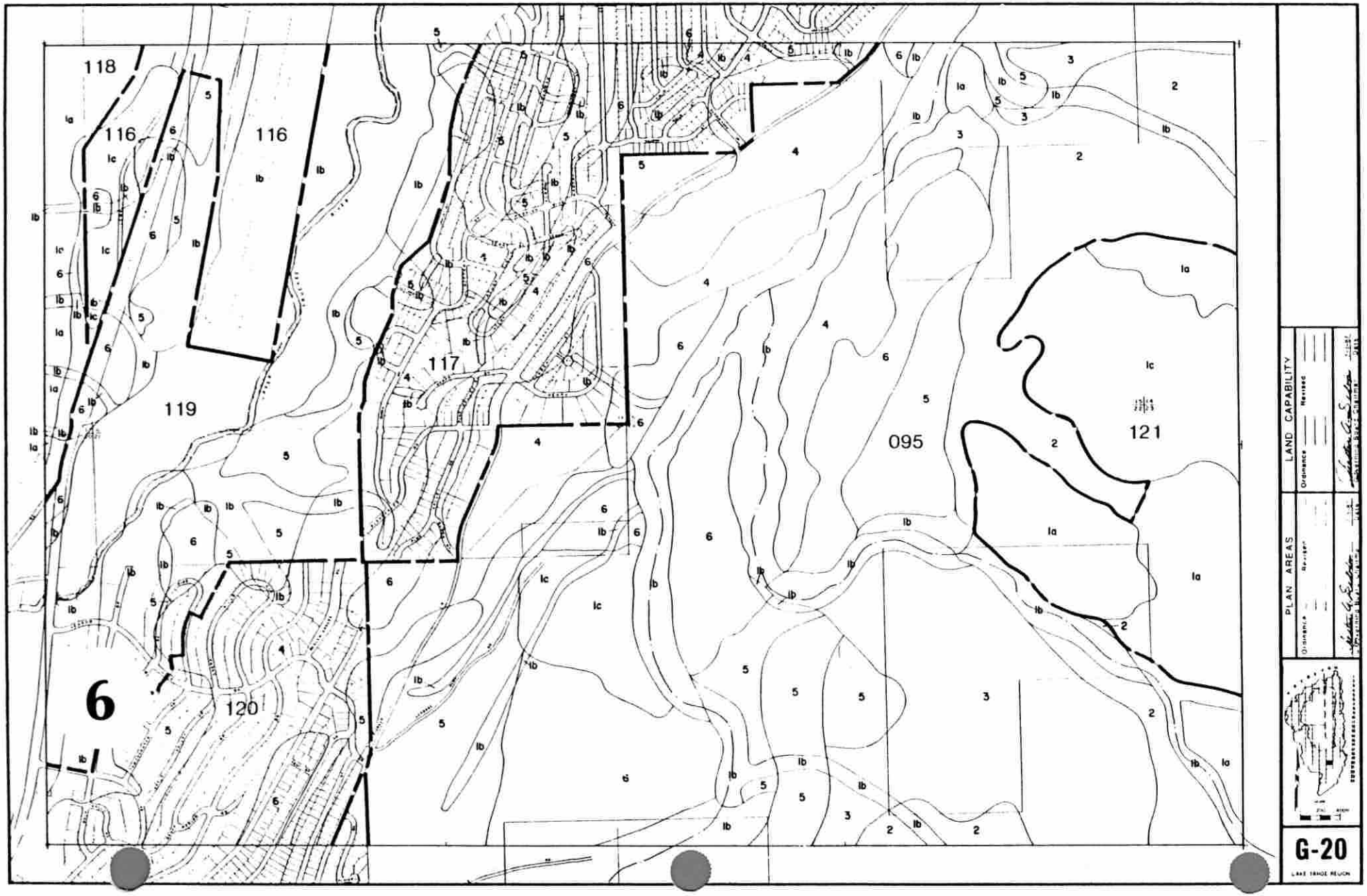
PROJECT LOCATION: The project area of approximately 10 acres is located off Highway 50 West between Elks Club Drive and Meadowvale Avenue in El Dorado County. Of the affected properties (Assessor Book 22, pgs. 21 and 22) 14 are vacant in public ownership and 9 are vacant in private ownership. The entire project area is classified as SEZ with Lo (1b) and Co (1b) soil types.

SITE DESCRIPTION/FIELD ANALYSIS: There is an unnecessary road crosscutting the meadow which provides a second access to one single family home. Unlined roadside drainage ditches along this road intercept the high groundwater table of the meadow. Rapid movement of runoff in spring has caused severe gullying in the meadow in several places and the drainage ditches carry high sediment loads. There are two vacant dilapidated houses on the far southeast corner of the project site on the corner of Highway 50 and Meadowvale Drive.

RESTORATION POTENTIAL: Restoration for this site includes removal of Boca Raton Drive from Elks Club to the one SFD it accommodates. The two vacant buildings should be removed and relocated out of the SEZ. Storm and roadside drainage improvements should be installed on Boca Raton Drive. Rocklined drainage should serve to reduce the velocity of storm runoff.

UPDATE: El Dorado County removed 36,000 square feet of Boca Raton pavement in 1987. The SEZ restoration was part of the Country Club Erosion Control Project funded by the California Tahoe Conservancy ($377,000).

SEZ Acreage Restored: 54,000 square feet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LAND CAPABILITY
Ordinance
Revised
PLAN AREAS
Ordinance
Revised
G-20
LAKE TAHOE REGION

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Upper Truckee; Elks Club Drive

PROJECT NUMBER: PA 119T

TRPA MAP: G-20

WATERSHED NAME (NUMBER): Upper Truckee River (73)

PRIORITY CATEGORY: High

PROJECT LOCATION: The project site is located in Tahoe Paradise, El Dorado County in the vicinity of the intersection of Elks Club Drive and Highway 50. Affected parcels include 33-191-02, 04, 05 and 06. Soil type is Lo, land capability 1b.

SITE DESCRIPTION/FIELD ANALYSIS: The project area, consisting of approximately 15 acres, is immediately adjacent to the Upper Truckee River and the Highway 50 bridge crossing. The Elks Clubhouse is situated on parcel 33-101-05. Caltrans owns parcel 33-101-04 where vehicles are stored during road construction. Access to the river is unobstructed from several locations and vehicle tracks are evident throughout the area. There is evidence of past revegetation work on the Caltrans parcel but it appears ineffective due to continued vehicle access to the river. The project site is over covered with impermeable surface on fill material which encroaches into the stream channel. Rock riprap has been placed in the channel to protect the Elks Club parking area. Extensive bank erosion is evident both upstream and downstream of the project site. The entire site is denuded of vegetation; vehicles access the river via several unpaved roads across the site. The area is generally unkempt; trash is evident throughout.

RESTORATION POTENTIAL: Vehicle access to the river should be restricted by fencing and signing. Unnecessary roads should be removed and revegetated. Stream bank stabilization is necessary in several spots. Elks Club should remove excessive land coverage and install BMP's. Excessive fill material should be removed and the area revegetated with meadow species. Roadside drainage on Elks Club Drive and storm drainage along the Elks Club development should be installed in the project area.


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LAND CAPABILITY
PLAN AREAS
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TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Santa Fe Road, Meyers

PROJECT NUMBER: PA 123 and 125

TRPA MAP: F-21

WATERSHED NAME (NUMBER): Upper Truckee River (73B)

PRIORITY CATEGORY: Medium

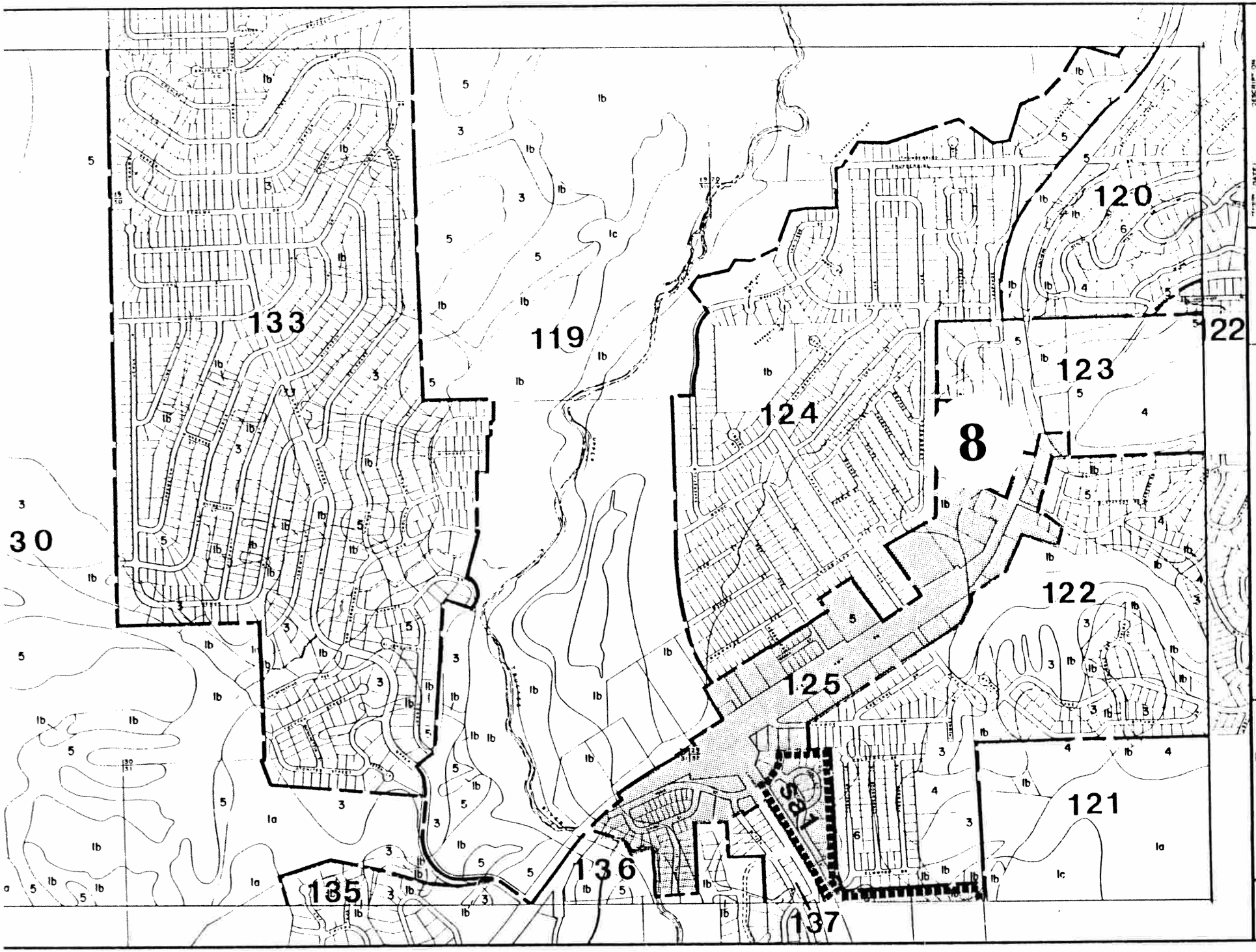
PROJECT LOCATION: The project site of approximately 10 acres is located off Highway 50 and Santa Fe Road in Meyers, El Dorado County, and lies within the Upper Truckee River watershed. The soil types are CO (1b) and LO (1b) with the area classified as SEZ. Of the affected vacant properties APN 34-402-02, 03, 05 through 30, 14 are in public ownership and 12 are in private ownership.

SITE DESCRIPTION/FIELD ANALYSIS: The SEZ is presently being used as a dump for heavy equipment, cars and appliances that people discard illegally. Large amounts of fill material are present on the site. The developed portion consists of commercial/industrial uses. Most driveways are unpaved, there are no BMP's in place, and the area is highly compacted. The undisturbed meadow area appears lush with vegetation. There is some evidence of groundwater diversion near the road and suspected leaking of pollutants from heavy equipment through unpaved driveways. Santa Fe Road construction has diverted the natural channel.

RESTORATION POTENTIAL: The waste dump (including autos and equipment) and fill material should be removed from the SEZ. Installation of BMP's on individual properties is mandatory for restoration of this SEZ.

IMPLEMENTATION: A voluntary Action Plan should be developed for the area and strict compliance of BMP's is necessary for developed properties in the project site, owners of undeveloped properties may wish to pursue TDR, OSE.

UPDATE: El Dorado County has scheduled a restoration project for 1988.



LAKE TAHOE REGION

MEYERS

EL DORADO COUNTY, CALIFORNIA

TAHOE REGIONAL PLANNING AGENCY

SCALE: 1" = 400'

CHECKED BY: S.E.M.

DATE: October 1971

DESCRIPTION

DATE

KEY MAP

F-21

436 D 556

TAHOE REGIONAL PLANNING AGENCY

SEZ RESTORATION PROJECT DESCRIPTION

PROJECT NAME: Angora Creek Drive - Mountain View Estates #5/6

PROJECT NUMBER: PA 132

TRPA MAP: F-20

WATERSHED NAME (NUMBER): Angora Creek (73C)

PRIORITY CATEGORY: Medium

PROJECT LOCATION: The project area is located in the vicinity of intersection of Lake Tahoe Boulevard and Angora Creek Road, View Circle and Mountain Meadow Drive, Mountain View Estates Number 5 and Number 6, El Dorado County. Restoration potential is approximately 15 acres. Land Capability is 1b with Co soils.

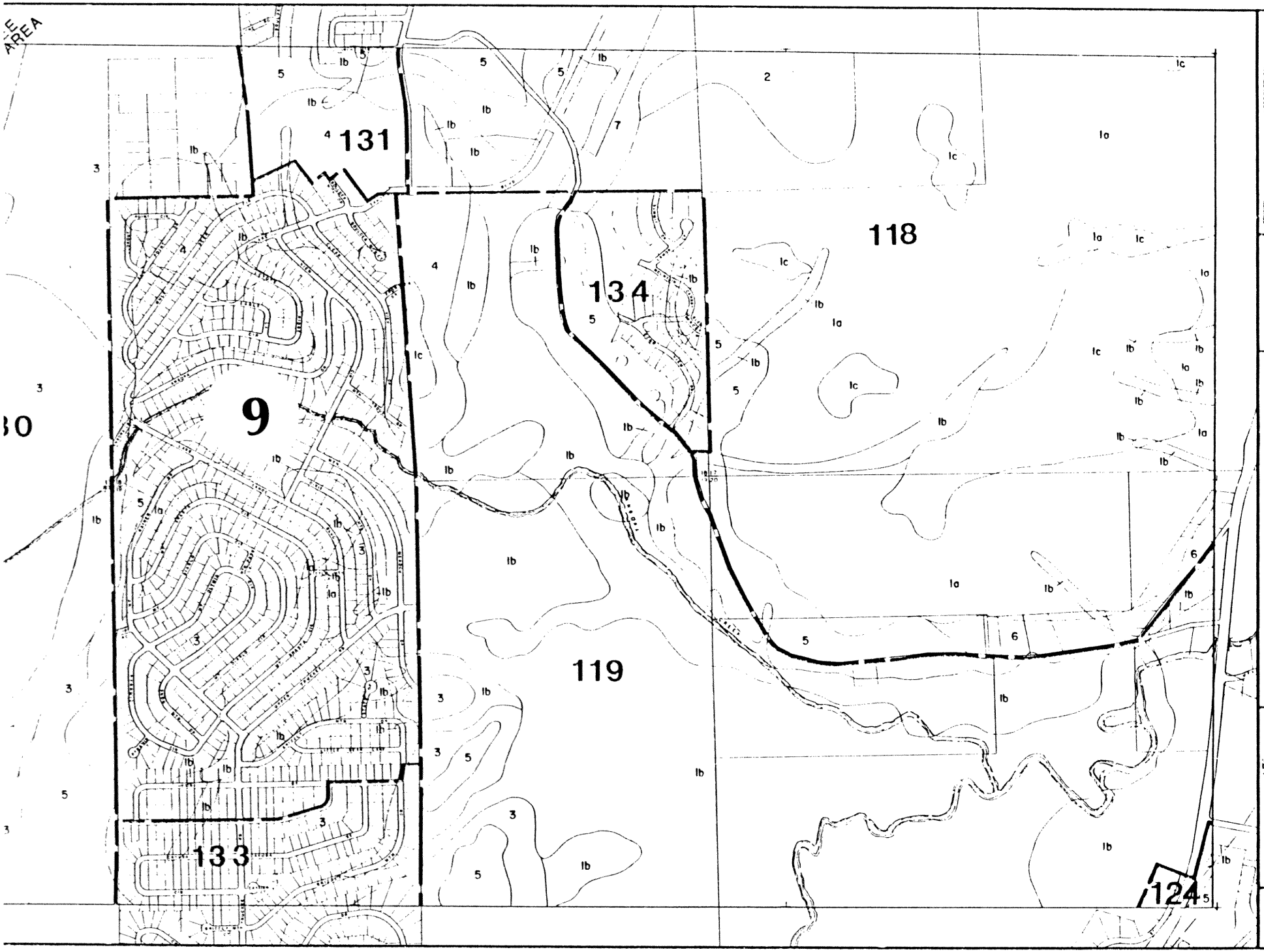
SITE DESCRIPTION: The project site of approximately 15 acres consists of a relatively undisturbed meadow which has been subdivided into 3/4 acre lots. Approximately 20% of the area is developed with single family dwellings, with the remaining lots undeveloped. The cul-de-sac portion of Angora Creek Drive built on fill material encroaches into the streamzone and presently does not access any development.

FIELD ANALYSIS: The meadow in general is relatively undisturbed. Yard encroachment is evident to the stream channel from parcels 33,524-01, 33-552-03, 09, 14, 15 and 17. ORV access to the large meadow (Lake Country Estates(is gained through vacant lots along Mountain Meadow Drive. The culverts in the project site appear to be inadequate; there is evidence of bankside erosion and channelization through the meadows.

RESTORATION POTENTIAL: Angora Creek Drive cul-de-sac should be removed and revegetated. Yard encroachment into the stream environment zone should be curtailed. Fencing and signing along Mountain Meadow Drive could prevent ORV use of the meadow. Culverts should be modified to accommodate peak stream flow. Bankside erosion should be stabilized and channelization of the stream flow should be reduced. Roadside drainage, storm drainage, slope stabilization and revegetation of disturbed areas will assist in restoring the meadow to a naturally functioning state. BMP's should be installed on all developed properties.

IMPLEMENTATION: TDR, lot retirement, open space easement are possible alternatives for property owners of undeveloped parcels.

UPDATE: Restoration project scheduled for 1988.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LAKE TAHOE REGION
TWIN PEAKS
EL DORADO COUNTY, CALIFORNIA
TRPA REGIONAL PLANNING AGENCY
DESCRIPTION
DATE
SCALE 1" = 400'
CHECKED BY S.E.H.
DATE October 1971
KEY MAP
F-20
444 D 556