UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

ESTABLISHMENT RECORD

FOR

GRASS LAKE RESEARCH NATURAL AREA

LAKE TAHOE BASIN MANAGEMENT UNIT

EL DORADO COUNTY, CALIFORNIA

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TITLE PAGE

Establishment Record for Grass Lake

Research Natural Area within Eldorado National Forest,

Managed as the Lake Tahoe Basin Management Unit,

El Dorado County, California.

ESTABLISHMENT RECORD FOR GRASS LAKE RNA

A. INTRODUCTION

The Grass Lake Research Natural Area (RNA), also known as Grass Lake Moss Bog, lies entirely on the Eldorado National Forest, on lands managed as the Lake Tahoe Basin Management Unit, sole administrator of this RNA. The area was nominated for RNA designation and a reconnaissance report was written by Diaz and Magill (undated). An ecological survey was completed in 1987 (Burke 1987).

Grass Lake RNA represents the sphagnum bog target element for the Northern Sierra Nevada Province of California. The RNA is not within Wilderness or other Congressionally designated areas.

1. Land Management Planning

The Lake Tahoe Basin Management Unit Land and Resource Management Plan (LRMP) recommends establishing the Grass Lake RNA. The LRMP sets management direction and standards and guidelines for protection of the RNA (Appendix 1).

B. OBJECTIVES

The Grass Lake RNA is established to preserve a representative area of the sphagnum bog type in the Northern Sierra Nevada physiographic province of the Pacific Southwest Region. Additional objectives in establishing the RNA include: to preserve and maintain genetic diversity; protect against serious environmental disruptions; serve as reference areas for the study of succession; provide onsite and extension educational activities; serve as baseline areas for measuring long-term ecological changes; serve as control areas for comparing results from manipulative research; and monitor effects of resource management techniques and practices.

C. JUSTIFICATION STATEMENT FOR ESTABLISHMENT OF AREA

Establishment of the RNA will protect the largest and best example of sphagnum bog in California and fill an important gap in the Regional RNA system. No other sphagnum bog RNA has been designated or proposed for the Northern Sierra Nevada province.

Bogs and peatlands are very rare natural communities in California. Grass Lake RNA represents the only remaining undisturbed site for palynological studies in the Sierra Nevada. The pollen record in the Grass Lake wetlands provides information on climatic and vegetation changes over the last 10,000 to 15,000 years.

The rich native flora and diverse wetland vegetation of the RNA are well documented. More than 270 species of vascular plants are known from the RNA vicinity, and eleven plant associations have been described from the sphagnum bog-montane meadow complex. The sphagnum bog-montane meadow complex is notably devoid of introduced plants, adding to its scientific value. Of special interest are three species of carnivorous plants and three orchid species found in the RNA (Burke 1987).

Grass Lake RNA provides excellent opportunities for studying montane bog and meadow ecology and vegetation succession. Establishment of the RNA will provide opportunities for comparative studies with similar habitats at Green Island Lake proposed RNA in the Cascade Range Province (Lassen National Forest). As Grass Lake RNA is accessible in all seasons by state highway, it provides an excellent research site.

D. PRINCIPAL DISTINGUISHING FEATURES

Grass Lake RNA contains the largest sphagnum bog in California. The RNA is a diverse mosaic of wetland communities in a montane valley, on the rim of the Lake Tahoe Basin. Six different terrestrial communities are represented: sphagnum bog, montane meadow, Jeffrey pine forest, red fir forest, lodgepole pine forest, and aspen riparian forest[1].

More than 270 species of vascular plants have been identified from the RNA vicinity. Tree species occurring in the RNA include: red fir (Abies magnifica), western white pine (Pinus monticola[2]), lodgepole pine (Pinus contorta var. murrayana) and aspen (Populus tremuloides).

No Federally or State-listed rare, threatened or endangered, or Forest-sensitive

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[1]Vegetation types follow Holland, R. F. 1986. Preliminary descriptions of the terrestrial natural communities of California.

[2]Nomenclature follows Little (1979) for trees, and Munz and Keck (1959) for all other plants.

plants or animals are known from the RNA.

E. LOCATION

1. The Grass Lake RNA is located on the Eldorado National Forest on lands managed as the Lake Tahoe Basin Management Unit. The RNA lies 12 air mi (19 km) southeast of Lake Tahoe, in El Dorado County, California.
2. Latitude and Longitude for the center of the area are 38′ 47′ N, 120′ 57′ W. The RNA is on the Freel Peak 7.5′ USGS quadrangle.
3. Boundary description (certified copy of the legal boundary description is included in the forward section of this document):

An area within the Eldorado National Forest, Eldorado County, California, managed by the Lake Tahoe Management Unit comprising portions of Sections 14, 15, 23, and 24, T. 11 N., R. 18 E., MDM as shown on the attached map entitled "Grss Lake RNA", said map being made herewith a part of this description, and said area being more particulary bounded and described as follows:

That portion and area within Eldorado National Forest bounded on the North by Highway 89; bounded on the West by Forest Road 12N13Y; bounded on the South by the 7,720' contour line; bounded on the East by the Eldorado/Alpine County Line.

The map referenced above and attached hereto for purposes of displaying and describing the boundaries of the Grass Lake RNA is a portion of Forest Service Primary Base Series Map "Freel Peak, California, F.S. NO. 522-3C, 1978" at a scale of 1:24,000 in original.

4. Size of Area

   Grass Lake RNA covers 360 acres (146 hectares) of National Forest land.

5. Elevations

   Elevations range from 7,680 ft (2,353 m) at the outlet stream to 7,800 ft (2,377 m) in the southeast corner.

6. Access to Area

   Grass Lake RNA is accessible year-round from State Highway 89 near Luther Pass. From South Lake Tahoe take Highway 50 west 8 mi (13 km) to Meyers; then south on Highway 89 for 9 mi (15 km) to Grass Lake. From Sacramento, take Highway 50 east for 97 mi (162 km) to Meyers; then south on Highway 89 for 9 mi (15 km) to Grass Lake. Several vehicle pull-outs are found along the south side of Highway 89 within the highway right-of-way. Foot travel within the bog is extremely wet during the spring and summer months.

F. AREA BY COVER TYPES

The extent and distribution of cover types was determined in the ecological survey (Burke 1987). Table 1 presents three classification systems. See Figure 3 for vegetation map.

Table 1. Area by cover types

CLASSIFICATION SYSTEM Vegetation Type	Percent of Total Area	Hectare	Acres
SAF FOREST TYPES (Eyre 1980)			
Lodgepole Pine Forest (218)	16	23	57
Red Fir Forest (207)	10	15	36
Aspen Forest (217)	5	7	17
Unclassified	69	101	250
Totals	100	146	360
KUCHLER VEGETATION TYPES (Kuchler 1966)			
Red Fir Forest (K-7)	10	15	36
Unclassified	90	131	324
Totals	100	146	360
CALIFORNIA NATURAL DIVERSITY DATA BASE (Holland 1986)			
Sphagnum Bog (51110) / Montane Meadow (45100)	69	101	250
Lodgepole Pine Forest (86100)	16	23	57
Red Fir Forest (85310)	10	15	36
Aspen Riparian Forest (61520)	5	7	17
Totals	100	146	360

G. PHYSICAL AND CLIMATIC CONDITIONS

Grass Lake RNA is situated in a montane valley on the rim of the Lake Tahoe Basin. Located east of the Sierra Nevada crest, Grass Lake lies between Thompson Peak and Waterhouse Peak in the Carson Range. Topography is generally flat within the RNA, while the surrounding land is steep and rocky. Waters which supply the lake and bog flow from several small permanent streams and seeps that arise on the slopes of Waterhouse and Thompson peaks and at the head of Grass Lake basin.

Grass Lake and vicinity are estimated to receive 40 in (157 mm) of precipitation annually. The majority of precipitation falls as winter snow, though summer thundershowers are not unusual.

The nearest station for which long term records are available is Tahoe City, 28 miles (45 km) to the northwest at an elevation of 6230 ft. (1899 m). Average maximum temperatures at that station during winter months range from 36° to 41° F (2° to 5° C), while average minimums range from 15° to -24° F (-9° to -31° C). Average maximum temperatures during summer range from 72° to 82° F (22° to 28° C), while average minimums range from 42° to 48° F (6° to 8° C).

H. DESCRIPTION OF VALUES

1. Flora

The most distinctive feature of Grass Lake RNA is its rich and unusual wetland flora, including a well developed sphagnum bog-montane meadow complex. Sphagnum bogs are very rare in California. Grass Lake represents the best intact example of this community in the Sierra Nevada. Eleven plant associations have been described from the bog-meadow complex, and these are virtually devoid of introduced plants, adding to their scientific value (Burke 1987).

More than 270 species of vascular plants have been identified from the RNA vicinity. Plants of special interest include the boreal elements: sedge (Carex limosa), willowy cottongrass (Eriophyllum gracile), and bogbean (Menyanthes trifoliata), all plants that are uncommon in the Sierra Nevada. In addition, three species of carnivorous plants, round-leaved sundew (Drosera rotundifolia) and bladderworts (Utricularia minor, and U. vulgaris), and three species of orchids, hooded spiral orchid (Spiranthes romanzoffiana), white bog orchid (Habenaria dilatata var. leucostachys), and green bog orchid (H. sparsiflora). A diverse non-vascular flora has also been identified in the Grass Lake wetlands

(Burke 1987).

No Federally or State-listed, or any Forest-listed Sensitive plants are known from the area (pers. comm. Joan Reynolds, Eldorado National Forest). See Appendix 2 for plant species lists.

Tree species occurring in the RNA include: red fir (Abies magnifica), western white pine (Pinus monticola), lodgepole pine (Pinus contorta var. murrayana) and quaking aspen (Populus tremuloides).

The following is a brief description of the vegetation types:

Sphagnum bog (51110)/Montane meadow (45100): The wetland communties of Grass Lake have often been described as transitional between a bog and a fen. The plant communities surrounding the quaking sphagnum bog, and associated with it, approach fens in water chemistry. Wet and dry montane meadows typical of the region are the other associated wetland communities which intergrade with the marshland. Eleven plant associations have been described from the sphagnum bog-montane meadow complex: brown moss-bladderwort bog; monkeyflower-shoresedge bog; long and short-beaked sedge wet meadow; short-beaked and inflated sedge meadow; Nebraska sedge transitional meadow; Nevada sedge-spikerush wet meadow; mountain bluegrass-smooth beaked sedge dry meadow; alpine laurel-lodgepole pine open forest; willow thicket; and streamside ephemeral association (Burke 1987).

Lodgepole pine forest (86100): A relatively narrow band of forest dominated by lodgepole pine (Pinus contorta var. murrayana) surrounds the meadows of the Grass Lake basin. Lodgepole pine accounts for the majority of the 50% cover of the overstory, with red fir an occasional associate. The understory is a relatively diverse mix of perennial herbs and shrubs.

Red fir forest (85310): Red fir (Abies magnifica), the dominant tree on the north-facing slopes of the Grass Lake basin, covers virtually all of the south slope of Waterhouse Peak and extends nearly to the edge of the Grass Lake wetlands where it enters the south border of the RNA in association with lodgepole pine. The understory is very nearly absent, though needle litter is dense.

Aspen riparian forest (61520): A fairly open riparian forest of quaking aspen (Populus tremuloides) follows the rushing streams which feed Grass Lake from the north. These cross Highway 89 and enter the northern border of the RNA along the meadow edge. Perennial herbs and forbs form a dense understory layer.

2. Fauna

No Federally or State listed threatened or endangered, nor any Forest-listed Sensitive animals have been reported from the RNA. However, the unique and diverse wetlands may provide habitat for unusual invertebrates (pers. comm. H. Soderberg, LTBMU Wildife Biologist)

Appendix 3 provides a list of vertebrate species likely to occur in the RNA. Species actually observed in the RNA and vicinity are indicated by an asterisk.

3. Geology

The Carson Range, in the vicinity of Grass Lake, is underlain by Cretaceous granitic intrusives. The peaks surrounding the RNA consist of three separate series of plutonic rocks; Bryan Meadow Granodiorite, Echo Lake Granodiorite; and Waterhouse Peak Granodiorite

Much of the southern end of the Tahoe Basin has been modified by glaciers. Glacial deposits of Pleistocene age are mapped at the east and west ends of the RNA. The majority of Grass Lake RNA is underlain by alluvial deposits of relatively recent age. They vary from poorly sorted bouldery sand and gravel to undifferentiated alluvium (Armin and John 1983).

4. Soils

The soils of Grass Lake RNA were mapped by the U. S. Soil Conservation Service (Rogers 1974). The majority of the RNA, corresponding to the meadow/bog complex, is mapped as marsh soils. Small areas on the east and west ends of the meadow/bog complex are mapped as Meeks series, characteristic of montane glacial moraines (see map 4).

Marsh soils (Mh): develops where the land is underwater for at least 10 months of the year; surface covered with 6 - 8 in (15 - 20 cm) of reddish

brown peat; below this peat layer is about 6 - 10 in (15 - 25 cm) of black peat, which is underlain by black muck; substratum of gleyed sand and gravel at a depth of 30 - 60 in (75 - 150 cm).

Meeks series (Mte): excessively drained, stony soils that are 41 - 70 in (102 - 175 cm) deep over a hardpan weakly cemented with silica; surface layer about 11 in (27 cm) thick, slightly acid very stony loamy coarse sand and gravelly loamy coarse sand; subsurface layer about 50 in (125 cm) thick, moderately acid gravelly loamy coarse sand.

5. Lands

The entire 360 acres (198 hectares) of Grass Lake RNA are public lands. No lands have been aquired, are reserved, or have outstanding rights.

6. Cultural

Washoe Indians were likely seasonal visitors to Grass Lake Basin. No permanent encampments have been found. Year-round Washoe settlements were maintained in small valleys, including Woodfords and Markleeville, in Alpine County at about 5500 ft (1682 m) elevation. The Grass Lake basin and Luther Pass served as a travel route from Woolfords to Lake Tahoe.

In 1854, Ira M. Luther was the first person to cross Luther Pass with a wagon and team. In 1850-60 the pass was used extensively to supply the mines. Two post settlement sites have been identified within the RNA in T12N, R18E, S15, SE 1/4. These include the remains of a log cabin, a rock alignment, fire ring, log rounds and various artifacts such as nails, barrel hoops and ceramic and glass fragments (Burke 1987).

I. IMPACTS AND POSSIBLE CONFLICTS

1. Mineral Resources

Withdrawal from mineral entry will be intitiated upon establishment of the RNA. This will have little impact on mineral resources.

2. Grazing

The RNA is not currently in a grazing allotment, and it will be excluded from any future grazing allotments.

3. Timber

The Grass Lake RNA is withdrawn from timber production, and only contains 36 acres (or 10 percent of the total area) in commercial red fir forest. Consequently, the RNA contains little commercial timber value.

4. Watershed Values

The RNA is at the headwaters of Grass Lake Creek, a tributary of the Upper Truckee River, which flows into Lake Tahoe. Diverse riparian vegetation is present in the RNA, including: wet and dry montane meadows, sphagnum bog, and montane riparian forest. Protection of the wetland vegetation is compatible with efforts to maintain high water quality in Lake Tahoe.

5. Recreation Values

Grass Lake RNA vicinity receives considerable recreational use. The proximity to the State Highway makes it a popular rest stop for travelers. The Forest Service has conducted guided interpretive tours of the area during the summer. Cross-country skiing occurs in the winter. Some unauthorized informal campsites are present. The Forest does not anticipate taking action to reduce winter visitor use unless it becomes apparent that natural values of the RNA are being affected, but interpretive tours have been discontinued in order to reduce visitor use during summer. The management plan will address appropriate means to further reduce visitor use and monitor impacts to the RNA.

6. Wildlife and Plant Values

Designation of the RNA will protect the special wildlife and plant values present in the area.

7. Special Management Area Values

Establishment of the RNA will not affect any congressionally designated, or Special Management areas.

8. Transportation Plans

Maintenance of Highway 89 on the northern border of the RNA is an

issue that will be addressed in the management plan for the RNA. The Regional RNA committee identified salting to de-ice the highway in winter as a concern. Coordination with California Department of Transportation Maintenance Division will be undertaken to develop a highway maintenance prescription that minimizes impacts to RNA vegetation and water quality.

J. MANAGEMENT PRESCRIPTION

The primary management objective for the Grass Lake RNA is the maintenance of biotic associations and ecological processes in their natural condition. Generally, standards for protection and management of the RNA must support and promote the basic objectives and purposes of establishment set forth in sections B and C of the Establishment Record. Appendix 1 contains management direction for the Grass Lake RNA included in the Lake Tahoe Basin Management Unit LRMP. The RNA is to be used for non-manipulative research, observation, and study.

1. Management Plan

Once established, detailed RNA management direction will be developed by the Lake Tahoe Basin Management Unit, in consultation with the Pacific Southwest Forest and Range Experiment Station. This direction will outline management practices, project prescriptions, use, and monitoring of activities to achieve specific objectives for the RNA.

K. ADMINISTRATION RECORDS AND PROTECTION

The responsibility for administration and protection of the RNA is with the Forest Supervisor, Lake Tahoe Basin Management Unit, P.O. Box 731002, South Lake Tahoe, California, 95731-7302. Attention will be given to the development and implementation of a wildfire management plan and management of recreational and highway maintenance activities to assure that RNA values are not jeopardized. There are no anticipated needs for increased law enforcement action.

L. ARCHIVING

The research coordinator is the Director, Pacific Southwest Forest and Range Experiment Station, 1960 Addison Street, Box 245, Berkeley, California 94701. The Director is responsible for approving and coordinating research, maintaining the area's research and data file, and lists of herbarium and species samples collected. This information will be made accessible to

interested scientists, managers and other research stations. Plant specimens will be stored primarily at the herbarium of University of California, Davis.

M. REFERENCES

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SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Grass Lake Research Natural Area

Eldorado National Forest

Managed in Lake Tahoe Basin Management Unit

El Dorado County, California

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that all boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation and FSM 4063.41 5.e(3) in arriving at this recommendation.

Prepared by Ken S Berg Date 3/1/91
Ken S. Berg, Consultant to The Nature Conservancy

Recommended by Robert E. Harris Date 12/2/91
Robert E. Harris, Forest Supervisor, Lake Tahoe Basin Management Unit

Recommended by Ronald E. Stewart Date 12/4/91
Ronald Stewart, Regional Forester, Pacific Southwest Region

Recommended by Enoch F. Bell Date 12/5/91
for Barbara C. Weber, Station Director, Pacific Southwest Forest and Range Experiment Station

ESTABLISHMENT RECORD FOR GRASS LAKE RNA

N. APPENDICES

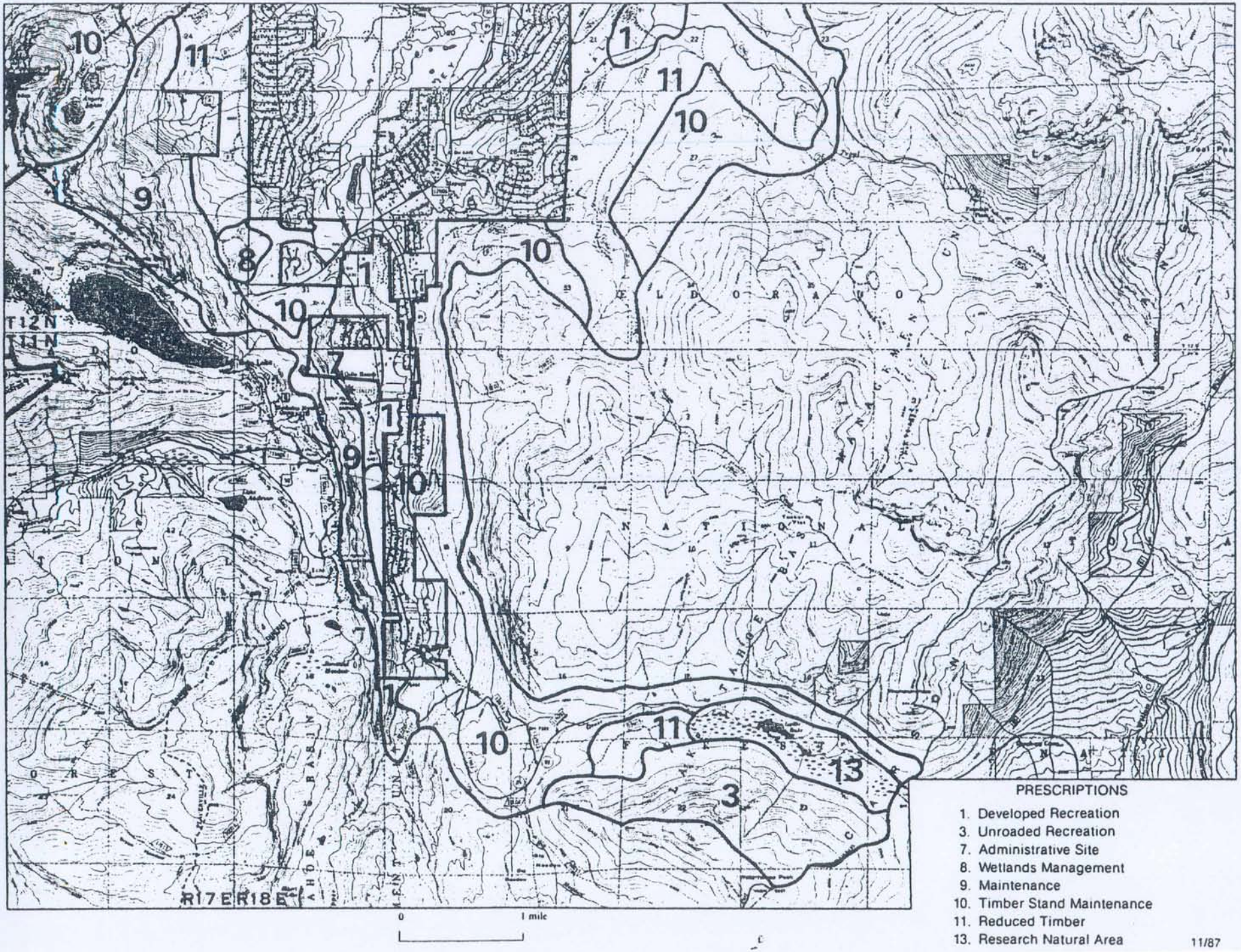
1. Management Direction from Lake Tahoe Basin Management Unit Land and Resource Management Plan

2. Plant Species List for Grass Lake RNA and vicinity

3. Vertebrate Species List for Lake Tahoe Basin Management Unit

APPENDIX 1. Management Direction from Lake Tahoe Basin Management Unit Land and Resource Management Plan

TAHOE VALLEY MANAGEMENT AREA SOUTH HALF



Management Area Direction

TAHOE VALLEY

Gross Acreage 28,855

15,840 National Forest System Acres
Miles of Lake Tahoe Shoreline:
5.1 Total
0.7 Local Gov't
4.4 Private

TRPA PLANNING AREAS: All or portions of 095, 100, 101, 118, 119, 121, 123, 125, 130, 136, 139, 141
Unsuitable Timber Lands: All Acres

I. Description:

This area includes most of the valley bottom at the south end of the lake, but extends along the Highway 89 corridor from Christmas Valley to Luther Pass. The incorporated City of South Lake Tahoe and the unincorporated communities of Tahoe Paradise, Meyers, Christmas Valley, and Montgomery Estates are within the boundaries. Much of the area is low hazard land classification, but there is considerable SEZ, including several of the larger streams of the basin, such as Upper Truckee River, Trout Creek, Saxon Creek, Angora Creek, Grass Lake Creek, Cold Creek, and Heavenly Valley Creek.

Osgood Bog, located near Highway 50 at the base of Flagpole Peak, is a rare boreal sphagnum bog, which has been recognized for its paleobotanical significance. It will be evaluated in this planning period to determine if it warrants designation as a Special Interest Area. Interim management protects its unique features. Except for the meadows and other wetlands bordering many of the streams or the marshes next to Lake Tahoe, most of the land is well forested with mixed conifer. Much of the timber management program of the past decade has been thinning in the dense stands of young trees. Red fir forest are found at the higher elevations near Luther Pass and Angora Ridge. The area is well roaded with the exception of the steep slopes of Waterhouse Peak and Echo Peak. Some of the roads are passable only to 4-wheel drive vehicles.

There is no national forest land on the shore of Lake Tahoe within the management area. Several recreation residence tracts (Rainbow, Bridge, Upper Truckee), the Meyers Work Center, and the Upper Truckee Ranger Station exist within the area and are an extension of communities on private land. The Upper Truckee Ranger Station is considered a historical site.

Intensive recreation use occurs throughout the area, especially by local residents.

II. Issues, Concerns, and Opportunities

1. Most of the national forest land in the area is at the urban interface. There is a large opportunity to serve a multitude of uses by residents and tourists in the communities. Available resources are often exceeded by the demand. Firewood cutting is intensively managed, but cannot meet the entire need of the local area. Some forms of recreation must be

restrained. Special use permits are considered on the merits of each case, but usually with the understanding that private land should be considered first. Occasionally people feel that the Forest Service should be more liberal in granting requests for use.

2. Residents at the urban interface with the national forest have expressed concern that insect and disease occurring in forest trees will affect trees on their property. There is also concern that wildfires will spread into a community.

3. Activities allowed or occurring on the national forest may produce noise levels that are disturbing to residents of urbanized areas. Chain saws or other equipment used for timber management purposes are an intermittent source of noise, while OHV are a more consistent source. Single noise event level standards have been established for OHV but not for chain saws. Cumulative noise event levels have been established as thresholds for different types of land use areas.

4. Access to public lands is often through urban areas. Where the amount of traffic is heavy, it can be disturbing to the neighborhood. In some instances, rights-of-way do not exist to assure public access.

5. Dispersed recreation users must park on streets within urbanized areas to access some public land, including trails that lack trailhead facilities. This is especially a problem in the winter where roads that access public land are not plowed of snow or are closed due to wet soil conditions. Parking is forced upon already narrow roads, or may not be available at all because of posted restrictions on roadway parking.

6. OHV activity is intensive at the urban interface and has generated controversy between recreationists and home owners. Some of this use complies with OHV direction, but much of it does not. Enforcement of OHV direction has not been consistent. There are opportunities to provide increased high quality OHV routes away from the urban interface.

7. Many property lines have not been surveyed to precisely establish the location of national forest land.

8. Reconnaissance of property lines has indicated that numerous (hundreds, possibly thousands) unauthorized occupancies and uses of public land are occurring by private property owners residing at the urban interface. Most of these cannot be dealt with until property lines are accurately surveyed. Once surveys are completed and existing problems are dealt with, then the prevention of future trespass will be a concern.

9. The Upper Truckee River represents one of the best stream-oriented recreation assets in the basin for fishing and rafting. Much of the stream does not have assured public access.

10. Some unauthorized camping takes place in proximity to the urbanized areas. This results in litter accumulations, increased risk of fire, and occasional conflicts with day use recreation.

11. Some large parcels of high capability national forest lands that are within or adjacent to the urban interface, such as the recently acquired Harootunian parcel, may be suitable for meeting the demand for urban recreation or service facilities. As in the case of small urban lots, these parcels may best be managed by local government.

12. Because of the landownership patterns of various Federal, State and local agencies, there is an opportunity to enhance recreation opportunities by coordinated planning for trail systems and facilities.

III. Resource Management Emphasis

Within much of the area the emphasis will be upon meeting the recreation, scenic and special uses demands of the large visiting and urban population that is in the area. Most of the recreation will be a variety of dispersed activities, but some land will be managed for existing and potential development. Along Highway 89 in the vicinity of Luther Pass there will be emphasis upon maintaining a scenic travel corridor. Fairly intensive forest management practices will be fostered on the high and moderate capability land.

This direction is similar to current management except that recreation expansion may occur through the construction of new sites and facilities. Previous direction limited recreation construction to that approved prior to 1980. Also, timber management activities will be more intensive.

The desired future condition will be to have healthy and diverse forest conditions that can support the variety and intensity of recreation and other activities demanded by the large nearby local and visiting population. Good access will be available by road and trail.

IV. Management Area Prescription

Prescription	Acres
1 - Developed Recreation	520
3 - Unroaded Recreation	1,000
7 - Administrative Sites	7
8 - Wetland	120
9 - Maintenance	1,653
10 - Timber Stand Maintenance	7,040
11 - Reduced Timber	4,619
12 - Urban Lots (not mapped)	521
13 - Research Natural Area	360

V. Management Area Standards and Guidelines

Forestwide standards and guidelines apply. The following direction supplements them:

Practice	Standard and Guideline
1- Recreation and VIS Site Construction	Recreation expansion is proposed to add an additional 545 PAOT in developed facilities. Develop project level plans to determine the precise nature, location and size of facilities at the Saxon Creek site. Work closely with other agencies in providing appropriate information programs and facilities for travelers entering the Tahoe Basin on Highway 50.
2- Dispersed Recreation Site Construction	Construct parking and other facilities to accomodate 315 PAOT (46 PAOT of which are an expansion over present use outside of an improved facility).
3- Development and Administration of Private Sector Recreation	Based upon the analysis conducted by the Forest Service, as documented in the Environmental Assessment for the proposed Rainbow Tract land exchange, August 31, 1979, the subject area will remain in public ownership and will continue to be managed by the Forest Service. Permits will authorize continued recreation use through 1999. The new permits will be subject to modifications or mitigating measures that may be required to protect the environment or to conform to then current Forest Service policies. Conduct a future use determination (FUD) for Bridge Recreation Residence Tract before the permits terminate in 1991, and for Upper Truckee Tract before the permits terminate in 1989. Recreation residences will not be allowed to enlarge in capacity or land coverage.
7- Dispersed Recreation Management - Summer	OHVs are permitted on designated roads and trails only. Routes will not be designated where conflicts between existing residential areas and users may be exacerbated. Resource monitoring and law enforcement programs will be expanded. OHV trails will be accessed from designated system roads and trailheads only; random access from residential streets will be discouraged. Maintain closures of

	Christmas Valley, Harootunian tract, and Al Tahoe to Ski Run areas to summer OHV use. Camping permitted in developed campgrounds and designated dispersed sites only.
8- Dispersed Recreation Management - Winter	The area is open to over-the-snow vehicles except for Grass Lake, the north slopes of Waterhouse Peak, the western side of Christmas Valley, and in the vicinity of Pioneer Trail and Black Bart. Continue to allow cross country skiing on Grass Lake Moss Bog when the area is designated as a Research Natural Area as long as the bog is not suffering adversely from this activity.
9- Visual Quality Restoration or Improvement	Cooperate with El Dorado County and the local community in Meyers on the preparation and implementation of the Highway 50 corridor scenic restoration plan.
10- Cultural Resources	Interpret the historic Hawley Grade Trail. Evaluate the historical significance of the Upper Truckee Ranger Station, and protect and interpret its historic values.
15- Nonstructural and 17- Structural Fish Habitat Management	Improve conditions on the Upper Truckee River for migratory and resident trout.
16- Structural Wildlife Habitat Improvements	Waterfowl nesting islands and tubs at Pope Marsh will be maintained. Tubs will be replaced by nesting islands in cooperation with the California Department of Fish and Game.
21- Range Pasture Management	Maintain the Upper Truckee Ranger Station pasture and the Cookhouse Meadow pasture primarily for Forest Service administrative use. Develop and implement plans to rehabilitate both pastures to improve forage and watershed condition.
35- Land and Resource Management Plan	Assist the Regional Research Natural Area committee in preparing a specific plan for management of Grass Lake Moss Bog when the area is included in the Research Natural Area System by the Chief. In the meantime, manage the area as if it were an RNA.

Evaluate Osgood Bog in this planning period for potential Special Interest Area designation.

VI. Proposed Resolution of Issues and Concerns

1. Uses in support of neighboring communities will be evaluated on a case-by-case basis in accord with forestwide standards and guidelines.

2. As timber stands are treated, approved management practices will improve the health of the forest, reducing the chance for epidemic occurrence of insects and diseases and thus the chance of spread into urbanized areas. It is expected that forest treatment at the interface will create shaded fuelbreaks that will reduce the potential for fire spread.

3. The Forest Service has not had great experience managing noise levels to achieve established thresholds. Monitoring of background and activity levels will help us to learn how to manage noise.

4. Parking sites will be designed and constructed to assure that the public can access the national forest during the summer and winter without severely impacting urbanized areas or private land.

5. Access routes into the national forest through urban areas will be evaluated to determine the extent of impact. Where the adverse impact is determined to be excessive, alternate routes will be sought.

6. The primary objective of OHV management in this area will be to provide high quality opportunities in a system of designated loops that relocate existing use to locations that have fewer impacts on residential neighborhoods. It may not be possible to remove all routes and trailheads from the urban fringe. OHV activities will be monitored for compliance with management direction. Where use is not consistent, action will be taken to gain compliance. It will probably be necessary to schedule where action will be taken, so that adequate resources can be focused to gain compliance through various techniques such as informing and educating users, providing barriers to access, and enforcement.

7. Surveys of property lines will be scheduled with priorities generally as established in the forestwide standards and guidelines. One or more decades will be required to accomplish having all property lines determined.

8. Determination of where unauthorized occupancies exist will depend first upon the establishment of accurate property lines. Once the lines are established, occupancy problems can be dealt with, usually case-by-case. Routine inspections and follow-up trespass action should reduce the extent of unauthorized use and occupancy.

9. Acquisition of lands through the Santini/Burton Act will gradually improve access to the Upper Truckee River as well as assuring a higher degree of protection of water quality and fish and wildlife habitat.

10. Camping closures will continue in effect with better signing and information programs.

11. Large parcels of high capability land near the urban interface will be evaluated to determine what use might be most appropriate. Where it appears that urban uses, not appropriate for national forest land, are the best use, transfer of management or ownership will be considered. Until such determination is made, management direction will be to keep the vegetation in a healthy diverse condition and to keep the site unencumbered with long term uses such as dispersed recreation facilities or designated OHV routes.

12. Encourage and participate actively in interagency planning for recreation development. The City of South Lake Tahoe, El Dorado County, California State Parks, California Tahoe Conservancy, CalTrans and LTBMU will all have important roles to play in this effort. Development of recreation opportunities should occur in the most suitable locations regardless of ownership. In some cases this may require land adjustment.

VII. Specific Monitoring and Evaluation Requirements

Where property lines are accurately established, periodic inspection shall be made to locate and deal with trespass.

Timber management and OHV activities at the urban interface should be monitored to determine if cumulative noise event level thresholds are exceeded.

may also be allowed where compatible. The visual quality objective is Retention. The preferred ROS setting is Roaded Natural.

11 - Reduced Timber Harvest

Apply group selection and single tree selection harvest practices to achieve wildlife habitat diversity and a high timber yield over the long term while protecting water quality. Opening size produced by group selection will average about 1 to 2 acres but will not exceed 5 acres. Yields from regenerated stands will be approximately 70% of maximum. Openings will benefit early successional stage species such as deer and quail and will increase diversity from the predominantly medium aged trees in the basin. Existing roads may be reconstructed primarily to meet water quality protection standards. Some temporary roads may be constructed for accessing timber. The visual quality objective is Partial Retention. The preferred ROS setting is Roaded Natural.

12 - Urban lots

Manage the small, environmentally sensitive lots in urbanized areas for their watershed and other environmental values as intended by Congress in PL 96-586. Resource management will be limited to that appropriate in residential neighborhoods, such as removing hazard trees, pest management, law enforcement, watershed protection and restoration, and minor wildlife and fish projects. Occasionally, some facilities may be appropriate to reduce the impact of dispersed recreation uses or to provide access to national forest land. Most of these lots are considered too environmentally sensitive to build upon. A plan will be developed to identify which lots are appropriate to transfer to State and local agencies and to specify the kinds of uses that would be allowed on transferred lots. The visual quality objective is Partial Retention. The preferred ROS setting is Rural.

13 - Research Natural Area

Maintain natural conditions to provide a sample ecosystem suitable for scientific study. Limit uses to research, study, observation, and monitoring and educational activities which are nondestructive and nonmanipulative. Dispersed recreation will not be encouraged, but it may occur to the extent it does not affect natural conditions. The visual quality objective is Preservation. The preferred ROS setting is Semi-Primitive Non-Motorized or Roaded Natural.

MOSSES AND LOWER VASCULAR PLANTS

AMAMBLYSTEGIACEAE

Drepanocladus aduncus
Drepanocladus fluitans

BARTRAMIACEAE

Philonotis montana var. *pumila*

EQUISETACEAE

Equisetum arvense L.

ISOETACEAE

Isoetes sp.

OPHIOGLOSSACEAE

Botrychium simplex Hitch.

PTERIDACEAE

Pteridium aquilinum (L.)Kuhn. var. *pubescens* Underw.

SPHAGNACEAE

Sphagnum squarrosum

CONIFEROUS PLANTS

CUPRESSACEAE

Juniperus occidentalis Hooker ssp. *australis* Vasek

PINACEAE

Abies concolor (Gordon & Glendenning)Lind.
Abies magnifica A. Murr.
Pinus albicaulis Engelm.
Pinus contorta Dougl. ssp. *murrayana* (Grav. & Balf.)Critchf.
Pinus jeffreyi Grev. & Balf.
Pinus monticola Dougl.
Tsuga mertensiana (Bong.)Carr.

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complied from the Grass Lake herbarium of R. Macdonald and the association tables of Béguin and Major (1974), with addition by M. Burke.

Nomenclature for vascular plants follows Munz, P.A. 1968. A California flora and supplement. Univ. of California Press, Berkeley, CA. Source of nomenclature for mosses unknown.

DICOTYLEDONS

APIACEAE

Angelica breweri Gray
Heracleum lanatum Michx.
Ligusticum grayi Coult. & Rose.
Osmorrhiza chilensis H.&A.
Perideridia gairdneri (H.&A.)Math.
Sphenosciadium capitellatum Gray

APOCYNACEAE

Apocynum androsaemifolium L.

ASTERACEAE

Achillea lanulosa Nutt.
Agoseris aurantiaca (Hook.)Greene
Agoseris glauca (Parch)Greene var. *monticola* (Greene)Q.Jones
Antennaria rosea Greene
Arnica chammassonis Less. ssp. *foliosa* (Nutt.)Maguire
Arnica diversifolia Greene
Arnica parryi Gray spp. *sonnei* (Greene)Maquire
Artemisia dracunculus L.
Artemisia tridentata Nutt.
Aster adscendens Lindl.in Hook.
Aster alpigenus (T.&G.)Gray ssp. *andersonii* (Gray)Onno.
Balsamorhiza sagittata (Pursh.)Nutt.
Chaenactis douglasii (Hook.)H.&A. var. *rubicaulis* (Rydb.)Ferris
Chrysothamnus nauseosus (Pall.)Britton
Cirsium andersonii (Gray)Petr.
Cirsium drummondii T. & G.
Crepis sp.
Erigeron breweri Gray
Erigeron coulteri Porter
Erigeron peregrinus (Pursh.)Greene ssp. *callianthemus* (Greene)Cronq.
Gnaphalium palustre Nutt.
Hieracium horridum Fries.
Machaeranthera shastensis Gray var. *glossophylla* (Piper)Cronq.& Keck
Senecio integerrimus Nutt. var. *exaltatus* (Nutt.)Cronq.
Senecio triangularis Hook.
Taraxacum officinale Wiggers.
Wyethia mollis Gray

BETULACEAE

Alnus tenuifolia Nutt.

BORAGINACEAE

Cryptantha simulans Greene
Cyptantha affinis (Gray)Greene
Hackelia jessicae (McGreg.)Brand
Hackelia longituba Jtn.

Hackelia sp.
Mertensia ciliata (James)G.Don var. *stomatechoides* (Kell.)Jeps.
Plagiobothrys hispidulus (Greene)Jtn.

BRASSICACEAE

Draba stenoloba Ledeb.
Rorippa curvisiliqua (Hook.)Bessey

CAPRIFOLIACEAE

Lonicera cauriana Fern.
Sambucus microbothrys Rydb.
Symphoricarpos acutus (Gray)Dieck.
Symphoricarpos vaccinoides Rydb.

CARYOPHYLLACEAE

Sagina saginoides (L.)Karst. var. *hersperia* Fern.
Silene menziesii Hook.
Stellaria longipes Goldie
Stellaria umbellata Turcz.

DROSERACEAE

Drosera rotundifolia L.

ERICACEAE

Arctostaphylos nevadensis Gray
Kalmia polifolia Wang. var. *microphylla* (Hook.)Rehd.
Ledum glandulosum Nutt. var. *californicum* (Kell.)C.L.Hitchc.
Phyllodoce breweri (Gray)Heller
Vaccinium occidentale Gray

FABACEAE

Lupinus andersonii Wats.
Lupinus polyphyllus Lindl. ssp. *superbus* (Heller)Munz
Lupinus sellulus Kell.
Trifolium longipes Nutt.
Trifolium monanthum Gray
Trifolium spp.

FAGACEAE

Castanopsis sempervirens (Kell.)Dudl.

GENTIANACEAE

Frasera speciosa Dougl. ex Griseb.
Gentiana amarella L.
Gentiana simplex Gray
Menyanthes trifoliata L.

GERANIACEAE

Geranium richardsonii Fisch. & Trautv.

HALORAGACEAE

Myriophyllum spicatum L. ssp. *exalbescens* (Fern)Hult.

HYDROPHYLLACEAE

Nemophila spatulata Cov.
Phacelia heterophylla Pursh. cf. ssp. *virgata* (Greene)Heckard
Phacelia hydrophylloides Torr. ex Gray
Phacelia sp.

HYPERICACEAE

Hypericum anagalloides Cham. & Schlecht.

LAMIACEAE

Monardella odoratissima Benth. ssp. *pallida* (Heller)Ep.

LENTIBULARIACEAE

Utricularia minor L.
Utricularia vulgaris L.

LINACEAE

Linum perenne L. ssp. *lewisii* (Pursh.)Hult.

MALVACEAE

Sidalcea oregana (Nutt.)Gray ssp. *spicata* (Regel)C.L.Hitchc.

NYMPHAEACEAE

Nuphar polysepalum Engelm.

ONAGRACEAE

Epilobium brevistylum Barb.
Epilobium glaberrimum Barb.
Epilobium glandulosum Lehm.
Epilobium hornemannii Rehd.
Epilobium minutum Lindl. ex Hook.
Epilobium oregonense Hausskn.
Epilobium sp.
Gayophytum diffusum T.&G. ssp. *parviflorum* Lew & Sawycrowski (syn. *Gayophytum nuttallii* T.&G.)

PAEONIACEAE

Paeonia brownii Dougl. ex Hook.

POLEMONIACEAE

Allophyllum integrifolium (Brandl.)A.& V.Grant
Collomia grandiflora Dougl. ex Lindl.
Ipomopsis aggregata (Pursh)V.Grant
Leptodactylon pungens (Torr.)Rydb. ssp. *pulchrriflorum* (Brand.)Mason
Phlox diffusa Benth.
Polemonium caeruleum L. ssp. *amygdalinum* (Wherry)Munz
Polemonium calif onicum Eastw.
Polemonium pulcherrimum Hook.

POLYGONACEAE

Eriogonum nudum Douglas var. *deductum* (Greene)Jepson (syn. *Eriogonum latifolium* Sm. ssp. *nudum* (Dougl.ex Benth.) var. *deductum*)
Eriogonum spergulinum Gray var. *reddingianum* (Jones)J.T.Howell
Eriogonum umbellatum Torr. var. *umbellatum*
Polygonum argyrocoleon Steud. ex Kuaze
Polygonum bistortoides Pursh.
Polygonum douglasii Greene
Polygonum sp.
Rumex acetosella L.

PORTULACEAE

Calyptridium umbellatum (Torr.)Greene
Lewisia pygmaea (Gray)Rob. in Gray

PRIMULACEAE

Dodecatheon alpinum (Gray)Greene ssp. *majus* H.J.Thomps.
Dodecatheon jefferyi VanHoutte

PYROLACEAE

Chimaphila menziesii (R.Br. ex D.Don)Spreng.
Pyrola picta Sm.
Pyrola secunda L.
Sarcodes sanguinea Torr.

RANUNCULACEAE

Aconitum columbianum Nutt.
Aquilegia formosa Fisher var. *truncata* (Fisher & Moyer)Baker
Delphinium polycladon Eastw.
Ranunculus alismaefolius Geyer ex Benth.
Ranunculus alismaefolius Geyer ex Benth. var. *alismellus* Gray
Thalictrum fendleri Engelm. ex Gray
Thalictrum sparsiflorum Turcz.

RHAMNACEAE

Ceanothus cordulatus Kell.

ROSACEAE

Amelanchier pallida Greene
Fragaria virginica L. ssp. *platypetala* Staudt. (syn. *Fragaria platypetala* Rydb.)
Geum macrophyllum Willd.
Holodiscus microphyllus Rydb.
Horkelia fusca Lindl. ssp. *parviflora* (Nutt.)Keck
Potentilla breweri Wats.
Potentilla drummondii Lehm.
Potentilla flabelliformis Lehm.
Potentilla glandulosa Lindl.
Potentilla glandulosa Lindl. ssp. *nevadensis*
Potentilla gracilis Dougl. ex Hook. ssp. *nuttalli*
Potentilla gracilis Dougl. ex Hook.
Potentilla palustris (L.)Scopoli (syn. *Comarum p.*)
Prunus emarginata (Dougl.)Walp.
Prunus tridentata (Pursh.)DC.

RUBIACEAE

Galium bifolium Watson
Kelloggia galioides Torr.

SALICACEAE

Populus tremuloides Michx.
Salix eastwoodiae Ckll.
Salix lemmonii Bebb.
Salix orestera C.K.Schneid
Salix planifolia Pursh. var. *monica* (Bebb.)C.K.Schneid
Salix rigida Muhl. (syn. *S. lutea* Nutt.)
Salix scouleriana Barr.

SAXIFRAGACEAE

Mitella breweri Gray
Ribes aureum Pursh.
Ribes divaricatum Dougl. var. *inerme* (Rydb.)McMinn
Ribes montigenum McClat.
Ribes roezlii Regel
Ribes viscosissimum Pursh.
Rubus parviflorus Nutt.
Saxifraga oregana Howell
Saxifraga punctata L. ssp. *arguta* (D.Don.)Hult.

SCROPHULARIACEAE

Castilleja applegatei Fern.
Castilleja miniata Dougl.ex Hook.
Collinsia parviflora Dougl. ex Lindl.
Collinsia torreyi Gray var. *wrightii* (Wats.)Jtn.
Cordylanthus pilosus Gray ssp. *bolanderi* (Gray)Munz
Mimulus guttatus Fisch. ex DC.
Mimulus jepsonii Grant

Mimulus lewisii Pursh.
Mimulus mephiticus Greene
Mimulus primuloides Benth. var. *pilosellus* (Greene)Smiley
Mimulus suksdorfii Gray
Mimulus tilingii Regel.
Pedicularis groenlandica Retzius
Penstemon gracilentus Gray
Penstemon laetus Gray ssp. *roezlii* (Regel)Keck
Penstemon newberryi Gray
Penstemon oreocharis Greene
Scrophularia californica Cham. & Schlecht.
Veronica americana (Raf.)Schw.
Veronica cusickii Gray
Veronica serpyllifolia L. var. *humifusa* (Dickson)Vahl.

VALERIANACEAE

Valeriana capitata Pall. ex Link ssp. *californica* (Heller)F.G.Mey

VIOLACEAE

Viola adunca Smith
Viola bakeri Greene
Viola macloskeyi Lloyd.
Viola sp.

MONOCOTYLEDONS

AMARYLLIDACEAE

Allium campanulatum Wats.
Allium validum Wat.

CYPERACEAE

Carex anthrostachya Olney
Carex aquatilis Wahl.
Carex athrostachya
Carex canescens L.
Carex capitata L.
Carex diandra Schrank.
Carex douglasii Boott.
Carex exserta Mkze.
Carex filifoia Boott.
Carex fissuricola Mkze.
Carex heteroneura Nutt.
Carex hoodii Boott.
Carex integra Mkze.
Carex jonesii Bailey
Carex lanuginosa Michaux
Carex leptopoda Mkze.
Carex limosa L.
Carex nebrascensis Dewey
Carex rostrata Stokes

Carex simulata Mkze.
Carex spectabilis Dewey
Carex teneraeformis Mkze.
Carex vesicaria L.
Eleocharis palustris (L.)R.&S.
Eleocharis pauciflora (Lightf.)Link var. *suksdorfiana* (syn. *Eleocharis quinquiflora*)
Eriophorum gracile Koch.

HYDROCHARITACEAE

Elodea nuttallii (Planch)St.John

JUNCACEAE

Juncus balticus Willd.
Juncus mertensianus Bong.
Juncus nevadensis Wats.
Juncus orthophyllus Cov.
Luzula comosa E.Mey

LILIACEAE

Lilium parvum Ren.
Smilicina stellata (L.)Desf.
Tofieldia gultinosa (Michx.)Pers. ssp. *occidentalis* (Wats.)C.L.Hitchc.
Veratrum californicum Durand.

ORCHIDACEAE

Corallorhiza maculata Raf.
Habenaria dilatata (Pursh.)Hook. var. *leucostachys* (Lindl.)Ames.
Habenaria sparsiflora Wats.
Spiranthes romanoffiana Cham.& Schl. var. *porrifolia* (syn. *Spiranthes porrifolia*)

POACEAE

Agropyron trachycaulum (Link)Malte
Agrostis diegoensis Vasey
Agrostis idahoensis Nash
Agrostis tenuis Vasey
Agrostis variabilis Rydb.
Bromus inermis Leyss.
Bromus marginatus Neex.
Calamagrostis canadensis (Michx)Beauv.
Calamagrostis inexpansa Gray
Calamagrostis neglecta
Calamagrostis purpurascens R.Br.
Danthonia intermedia Vasey
Deschampsia caespitosa (L.)Beauv.
Deschampsia elongata (Hook.)Beauv.
Festuca brachyphylla Schult.
Festuca cf. ovina
Festuca subulata Trin. in Bong
Glyceria grandis Wats.
Glyceria sp.

Melica aristata Thunb.
Melica bulbosa Geyer
Muhlenbergia filiformis (Thurb.)Rydb.
Muhlenbergia richardsonis (Trin.)Rydb.
Phleum alpinum L.
Poa epilis Schiber
Poa pratensis L.
Puccinellia pauciflora (Presl.)Munz (syn. *Torreyochloa pauciflora*)
Sitanion hystrix (Nutt.)J.G.Sm.
Stipa californica Merr. & Davy
Stipa columbiana Macoun.
Stipa occidentalis Thurb.
Trisetum spicatum (L.)Richt.

POTAMOGETONACEAE

Potamogeton natans
Potamogeton sp.

SPARGANIACEAE

Sparganium angustifolium Michx.
Sparganium minimum Fries

APPENDIX 3. Vertebrate Species List for Lake Tahoe Basin Management Unit

Adapted from Burke (1987)

Checklist of Reptiles and Amphibians

1.	Long-toed Salamander	*Ambystoma macrodactylum*
2.	Great Basin Spadefoot Toad	*Scaphiopus intermontanus*
3.	Western Toad *	*Bufo boreas*
4.	Pacific Treefrog *	*Hyla regilla*
5.	Leopard Frog	*Rana pipiens*
6.	Mountain Yellow-legged Frog	*Rana muscosa*
7.	Bullfrog	*Rana catesbeiana*
8.	Western Pond Turtle	*Clemmys marmorata*
9.	Western Fence Lizard	*Sceloporus occidentialis*
10.	Sagebrush Lizard	*Sceloporus graciosus*
11.	Western Skink	*Eumeces skiltonianus*
12.	Northern Alligator Lizard	*Gerrhonotus coeruleus*
13.	Rubber Boa *	*Charina bottae*
14.	Racer	*Coluber constrictor*
15.	Coachwhip	*Masticophis flagellum*
16.	Striped Whipsnake	*Masticophis taeniatus*
17.	Gopher Snake	*Pituophis melanoleucus*
18.	Common Kingsnake	*Lampropeltis getulus*
19.	California Mountain Kingsnake	*Lampropeltis zonata*
20.	Common Garter Snake *	*Thamnophis sirtalis*
21.	Western Terrestrial Garter Snake	*Thamnophis elegans*
22.	Western Aquatic Garter Snake	*Thamnophis couchii*
23.	Western Rattlesnake	*Crotalus viridis*

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* sighted by Steward (1978) at Grass Lake and surrounding habitats.

Nomenclature follows Stebbins, R.C. 1988. A field guide to western reptiles and amphibians. Houghton Mifflin, Boston. 336 pages.

Checklist of Mammals

1.	Vagrant Shrew	Sorex vagrans
2.	Dusky Shrew	Sorex monticolus
3.	Water Shrew	Sorex palustris
4.	Trowbridge Shrew	Sorex trowbridgii
5.	Broad-footed Mole *	Scapanus latimanus
6.	Little Brown Myotis	Myotis lucifugus
7.	Yuma Myotis	Myotis yumanensis
8.	Long-eared Myotis	Myotis evotis
9.	Fringed Myotis	Myotis thysanodes
10.	Long-legged Myotis	Myotis volans
11.	California Myotis	Myotis californicus
12.	Silver-haired Bat	Lasionycteris noctovagans
13.	Big Brown Bat	Eptesicus fuscus
14.	Pika	Ochotona princeps
15.	Snowshoe Hare	Lepus americanus
16.	White-tailed Jackrabbit	Lepus townsendii
17.	Black-tailed Jackrabbit	Lepus californicus
18.	Nuttall Cottontail	Sylvilagus nuttallii
19.	Mountain Beaver	Apoldontia rufa
20.	Least Chipmunk	Eutamias minimus
21.	Yellow Pine Chipmunk	Eutamias amoenus
22.	Townsend Chipmunk	Eutamias townsendii
23.	Long-eared Chipmunk	Eutamias quadrimaculatus
24.	Lodgepole Chipmunk	Eutamias speciosus
25.	Yellow-bellied Marmot *	Marmota flaviventris
26.	Belding Ground Squirrel *	Spermophilus beldingi
27.	California Ground Squirrel	Spermophilus beecheyi
28.	Golden-mantled Ground Squirrel *	Spermophilis lateralis
29.	Western Gray Squirrel	Sciurus griseus
30.	Douglas Squirrel *	Tamiasciurus douglasii
31.	Northern Flying Squirrel	Glaucomys sabrinus
32.	Mountain Pocket Gopher *	Thomomys monticola
33.	Northern Pocket Gopher	Thomomys talpoides
34.	Great Basin Pocket Mouse	Perognathus parvus
35.	Beaver	Castor canadensis
36.	Western Harvest Mouse	Reithrodontomys megalotis
37.	Deer Mouse	Peromyscus maniculatus
38.	Brush Mouse	Peromyscus boylii
39.	Pinon Mouse	Peromyscus truei
40.	Bushy-tailed Woodrat	Neotoma cinerea
41.	Heather Vole	Phenacomys intermedius
42.	Montane Vole *	Microtus montanus
43.	Long-tailed Vole	Microtus longicaudus
44.	Muskrat	Ondatra zibethica
45.	Western Jumping Mouse *	Zapus princeps
46.	Porcupine *	Erethizon dorsatum
47.	Coyote	Canis latrans
48.	Red Fox	Vulpes vulpes
49.	Black Bear *	Ursus americanus
50.	Gray Fox	Urocyon cinereoargenteus

Nomenclature follows Whitaker, J.O. 1980. The Audubon Society field guide to North American mammals. Alfred A.Knopf, New York. 745 pages.

51. Raccoon	Procyon lotor
52. Marten	Martes americana
53. Fisher	Martes pennanti
54. Ermine	Mustela erminea
55. Long-tailed Weasel*	Mustela frenata
56. Mink	Mustela vison
57. Wolverine	Gulo Gulo
58. Badger	Taxidea taxus
59. Western Spotted Skunk	Spiogale gracilis
60. Stripped Skunk	Mephitis mephitis
61. River Otter	Lutra canadensis
62. Mountain Lion	Felis concolor
63. Bobcat	Felis rufus
64. Mule Deer*	Odocoileus hemionus

LAKE TAHOE BASIN MANAGEMENT UNIT

CHECK-LIST OF BIRDS

LOONS & GREBES

1. Common Loon
2. Horned Grebe
3. Eared Grebe
4. Western Grebe
5. Pied-billed Grebe

HERONS & EGRETS

6. Great Blue Heron

BITTERNS

7. Least Bittern
8. American Bittern

SWANS

9. Whistling Swan

DUCKS & GEESE

10. Canada Goose
11. Mallard *
12. Gadwall
13. Pintail
14. Green-winged Teal
15. Cinnamon Teal
16. American Wigeon
17. Northern Shoveler
18. Wood Duck
19. Redhead
20. Ring-necked Duck
21. Canvasback
22. Greater Scaup
23. Lesser Scaup
24. Common Goldeneye
25. Bufflehead
26. Ruddy Duck
27. Common Merganser *

VULTURES, HAWKS & FALCONS

28. Turkey Vulture
29. Goshawk
30. Sharp-shinned Hawk
31. Cooper Hawk
32. Red-tailed Hawk *
33. Golden Eagle
34. Bald Eagle
35. Marsh Hawk
36. Osprey
37. Merlin
38. Prairie Falcon
39. Peregrine Falcon
40. American Kestrel

GROUSE, QUAIL & CHUKAR

41. Blue Grouse *
42. Mountain Quail

RAILS & COOTS

43. Virginia Rail
44. Sora Rail
45. American Coot

PLOVERS

46. Semi-palmated Plover
47. Killdeer

SHOREBIRDS

48. Common Snipe *
49. Spotted Sandpiper *
50. Willet
51. Least Sandpiper
52. Short-billed Dowitcher
53. Long-billed Dowitcher
54. Western Sandpiper
55. American Avocet
56. Wilson Phalarope
57. Northern Phalarope

GULLS & TERNS

58. Herring Gull
59. California Gull
60. Ring-billed Gull
61. Forster Tern

PIGEONS & DOVES

62. Band-tailed Pigeon
63. Rock Dove
64. Mourning Dove

OWLS

65. Screech Owl
66. Flammulated Owl
67. Great Horned Owl
68. Pygmy Owl
69. Spotted Owl
70. Long-Eared Owl
71. Saw-whet Owl

NIGHTHAWKS & GOATSUCKERS

72. Poor-will
73. Common Nighthawk

SWIFTS

74. Vaux Swift
75. White-throated Swift.

HUMMINGBIRDS

76. Anna Hummingbird
77. Rufous Hummingbird ✱
78. Calliope Hummingbird

KINGFISHERS

79. Belted Kingfisher ✱

WOODPECKERS

80. Common Flicker
81. Pileated Woodpecker
82. Lewis Woodpecker
83. Red-breasted Woodpecker
84. Williamson Sapsucker
85. Hairy Woodpecker ✱
86. Downy Woodpecker
87. White-headed Woodpecker
88. Black-backed Three-toed Woodpecker

FLYCATCHERS

89. Willow Flycatcher
90. Hammond Flycatcher
91. Dusky Flycatcher
92. Western Wood Pewee *
93. Olive-sided Flycatcher

LARKS

94. Horned Lark

SWALLOWS

95. Violet-green Swallow *
96. Tree Swallow *
97. Rough-winged Swallow
98. Barn Swallow
99. Cliff Swallow

JAYS, MAGPIES & CROWS

100. Steller Jay *
101. Black-billed Magpie
102. Clark Nutcracker *

CHICKADEES

103. Mountain Chickadee *

BUSHTITS

104. Bushtit

NUTHATCHES

105. White-breasted Nuthatch *
106. Red-breasted Nuthatch *
107. Pygmy Nuthatch

CREEPERS

108. Brown Creeper

DIPPERS

109. Dipper

WRENS

110. House Wren
111. Winter Wren
112. Bewick Wren
113. Long-billed Marsh Wren
114. Canon Wren
115. Rock Wren

THRUSHES & SOLITAIRES

116. American Robin *
117. Varied Thrush
118. Hermit Thrush *
119. Swainson Thrush
120. Western Bluebird
121. Mountain Bluebird
122. Townsend Solitaire

GNATCATCHERS & KINGLETS

123. Golden-crowned Kinglet
124. Ruby-crowned Kinglet *

PIPITS

125. Water Pipit

STARLINGS

126. Starling

VIREOS

127. Solitary Vireo
128. Warbling Vireo

WARBLERS

129. Orange-crowned Warbler
130. Yellow Warbler
131. Nashville Warbler *
132. Yellow-rumped Warbler
133. Black-throated Gray Warbler
134. Townsend Warbler
135. Hermit Warbler
136. MacGillivray Warbler
137. Common Yellowthroat
138. Wilson Warbler *

Audubon Warbler *

WEAVER FINCHES

139. House Sparrow

BLACKBIRDS & ORIOLES

140. Western Meadowlark
141. Yellow-headed Blackbird
142. Red-winged Blackbird *
143. Northern Oriole
144. Brewer Blackbird
145. Brown-headed Cowbird

TANANGERS

146. Western Tananger *

FINCHES, GROSBEAKS & BUNTINGS

147. Black-headed Grosbeak
148. Lazuli Bunting
149. Evening Grosbeak
150. Purple Finch
151. Cassin Finch
152. House Finch
153. Pine Grosbeak *
154. Gray-crowned Rosy Finch
155. Pink Siskin
156. Lesser Goldfinch
157. Red Crossbill

TOWHEES & SPARROWS

158. Green-tailed Towhee
159. Rufoussided Towhee
160. Savannah Sparrow
161. Oregon Junco *
162. Chipping Sparrow *
163. Brewer Sparrow
164. White-crowned Sparrow *
165. Golden-crowned Sparrow
166. Fox Sparrow *
167. Lincoln Sparrow *
168. Song Sparrow *

Research Natural Area Boundary Description

Grass Lake RNA

An area within the Eldorado National Forest, Eldorado County, California, managed by the Lake Tahoe Management Unit comprising portions of Sections 14, 15, 23, and 24, T. 11 N., R. 18 E., MDM as shown on the attached map entitled "Grss Lake RNA", said map being made herewith a part of this description, and said area being more particulary bounded and described as follows:

That portion and area within Eldorado National Forest bounded on the North by Highway 89; bounded on the West by Forest Road 12N13Y; bounded on the South by the 7,720' contour line; bounded on the East by the Eldorado/Alpine County Line.

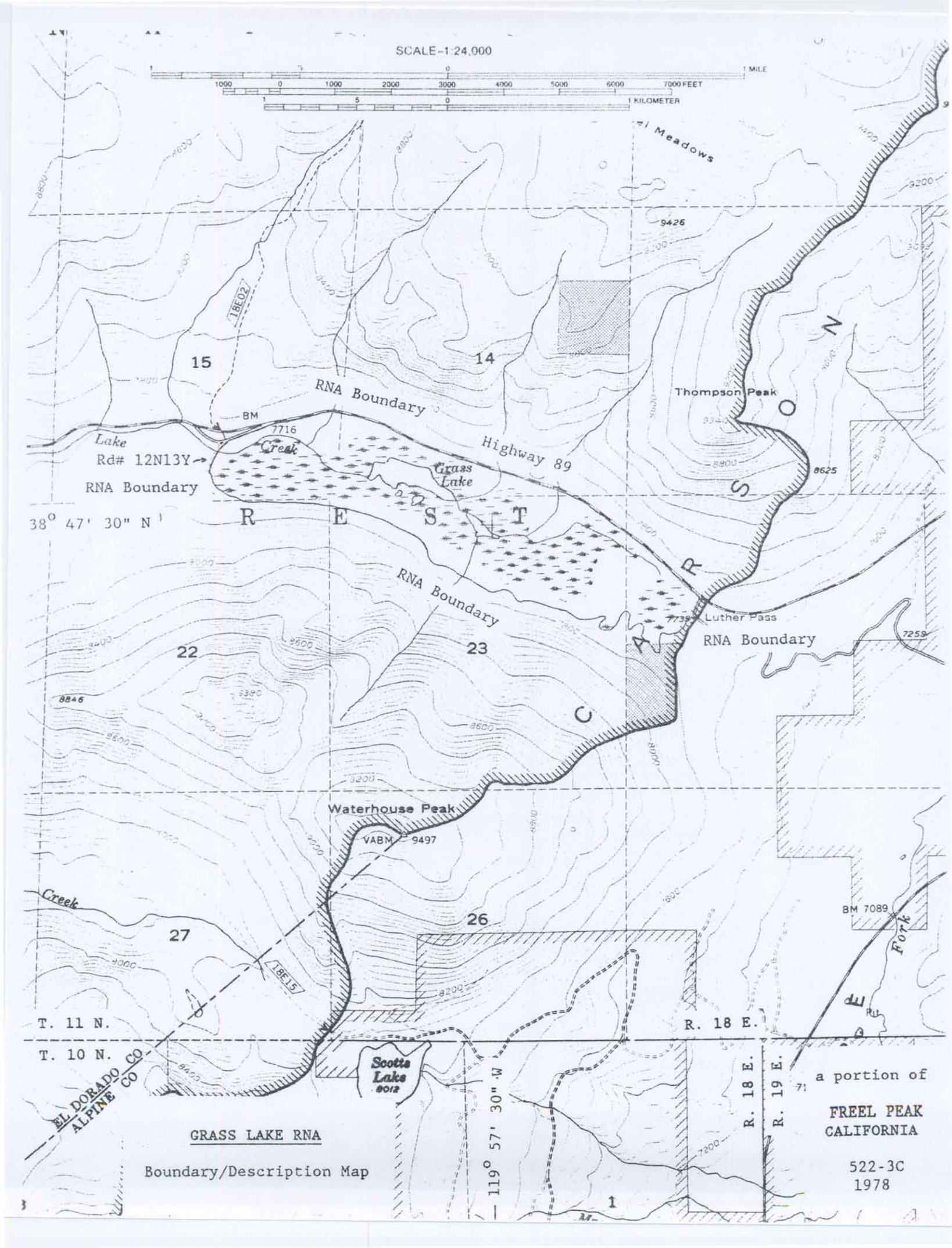
The map referenced above and attached hereto for purposes of displaying and describing the boundaries of the Grass Lake RNA is a portion of Forest Service Primary Base Series Map "Freel Peak, California, F.S. NO. 522-3C, 1978" at a scale of 1:24,000 in original.

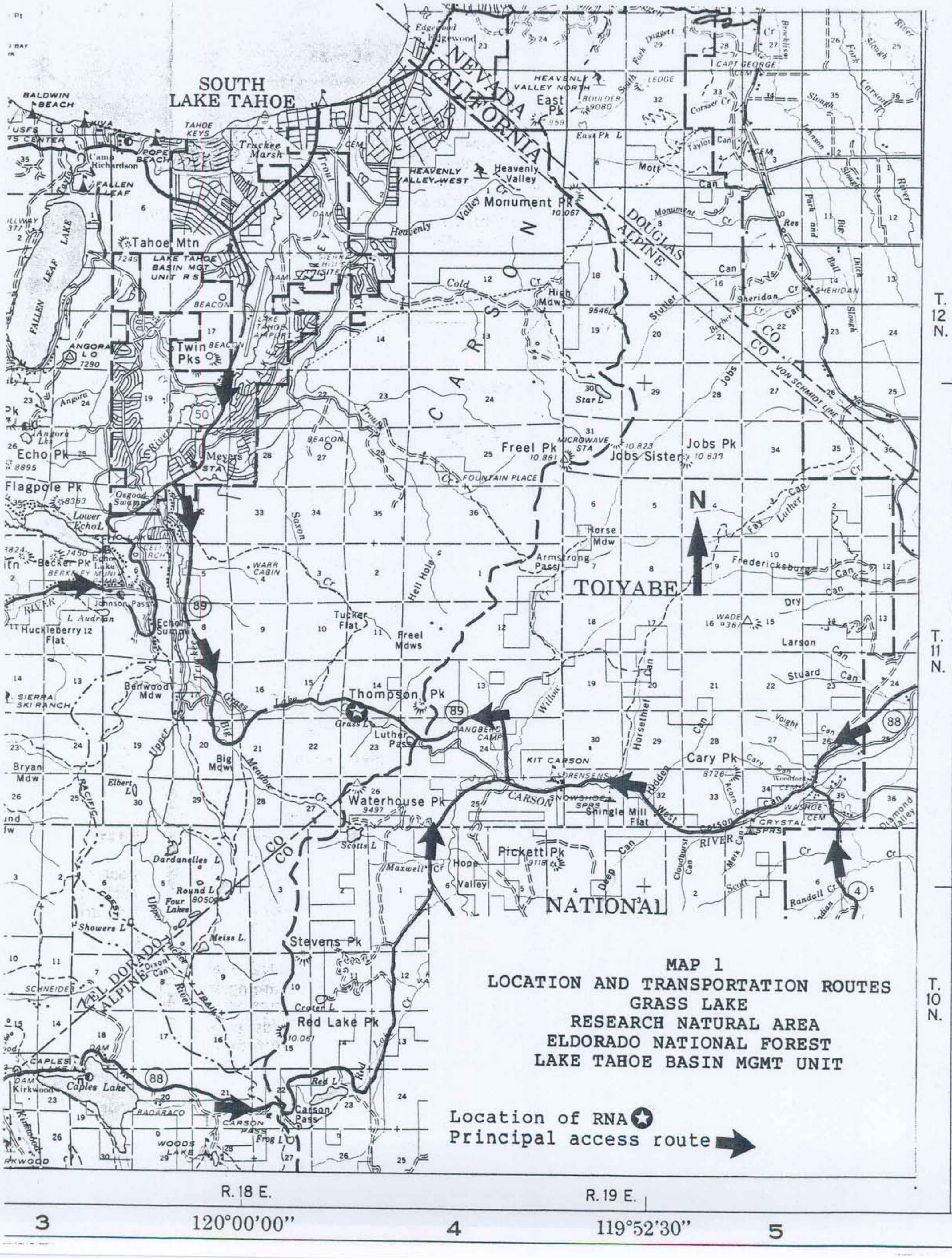
End of Description

I certify that the above boundary description of the Grass Lake Research Natural Area was prepared by me or under my direct supervision.

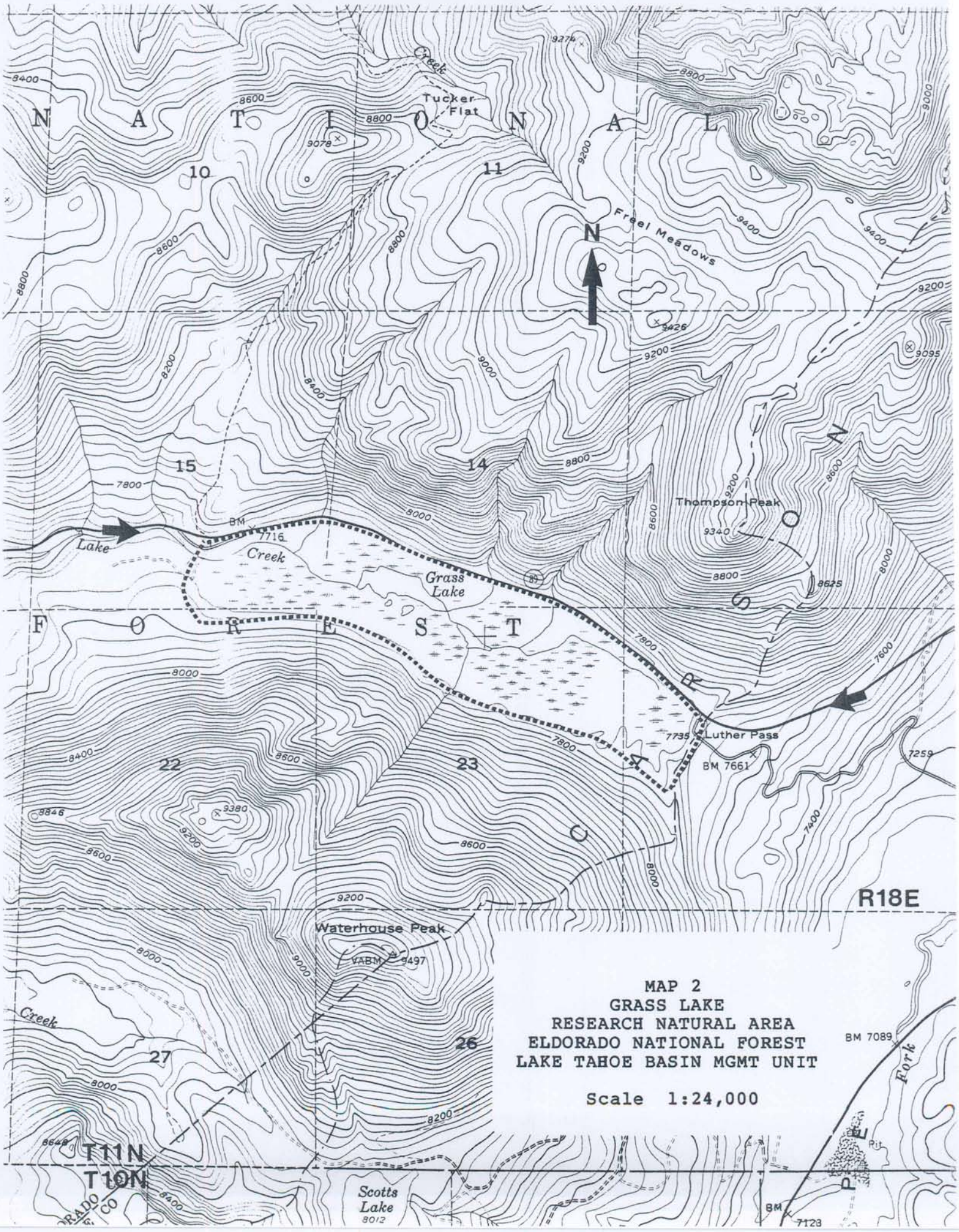
Carlton W. Tompkins 12/02/91

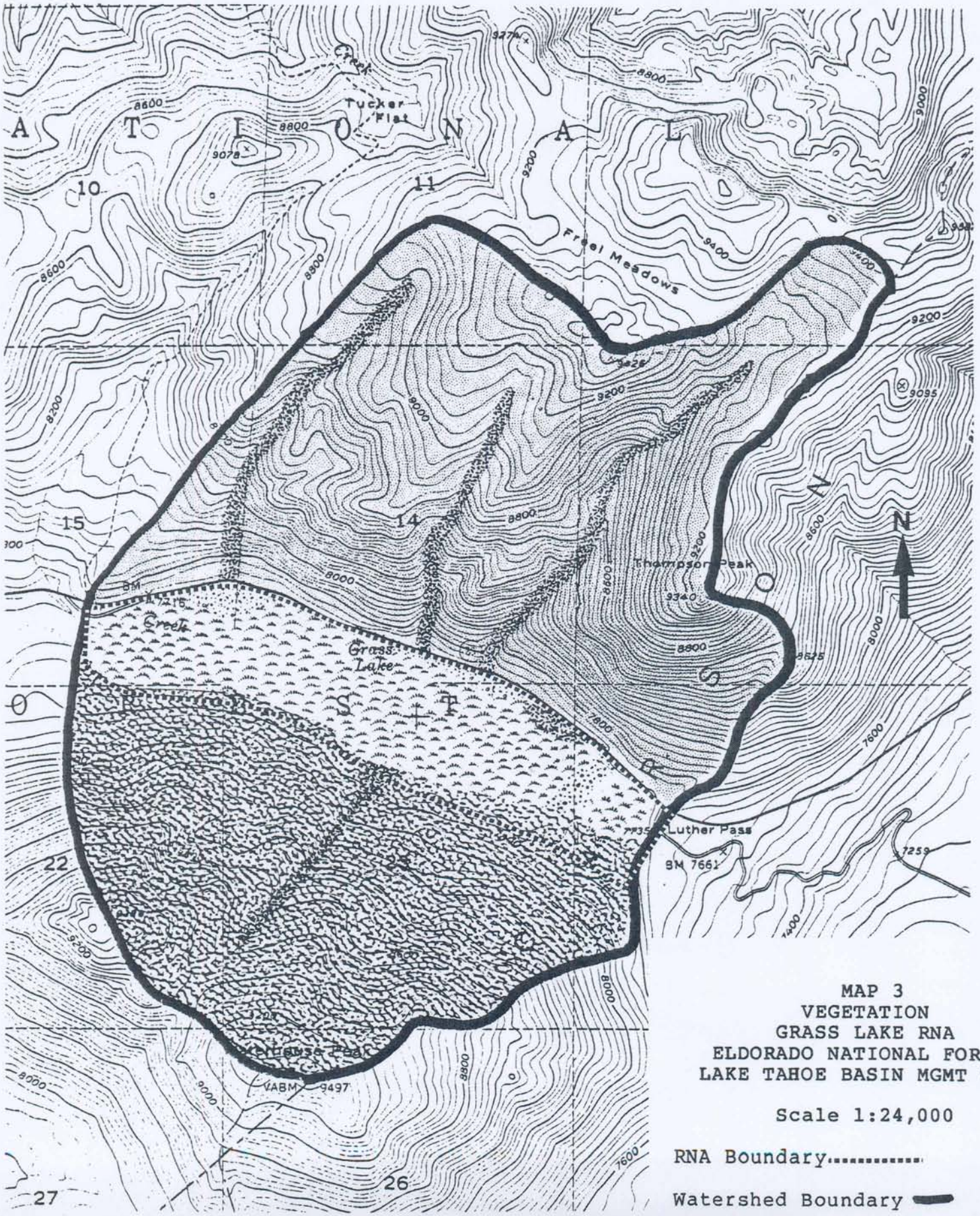
Regional Land Surveyor — Date
Pacific Southwest Region


SCALE-1:24,000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
Meadows
9426
18E02
15
14
RNA Boundary
BM 7716
Lake
Creek
Rd# 12N13Y
RNA Boundary
Grass Lake
Highway 89
Thompson Peak
8625
38° 47' 30" N
R E S T
S O N
C A R
RNA Boundary
7739
Luther Pass
RNA Boundary
7259
22
23
8846
Waterhouse Peak
VABM 9497
Creek
27
26
18E15
BM 7089
Fork
T. 11 N.
T. 10 N.
R. 18 E.
Scotts Lake 8012
EL DORADO CO
ALPINE CO
119° 57' 30" W
R. 18 E.
R. 19 E.
1
7200
a portion of
FREEL PEAK
CALIFORNIA
522-3C
1978
GRASS LAKE RNA
Boundary/Description Map


SOUTH LAKE TAHOE
NEVADA
CALIFORNIA
DOUGLAS
ALPINE
CARSON
TOIYABE
NATIONAL
EL DORADO
ALPINE
Heavenly Valley
Monument Pk
Tahoe Mtn
Twin Pks
Echo Pk
Flagpole Pk
Freel Pk
Jobs Sister
Jobs Pk
Thompson Pk
Grass L
Luther Pass
Waterhouse Pk
Pickett Pk
Stevens Pk
Red Lake Pk
Caples Lake
Carson Pass
Kirkwood
Hope Valley
Cary Pk
Armstrong Pass
Fredericksburg
Echo Summit
Meyers
Fallen Leaf Lake
Big Mdw
Scotts L
Round L
Four Lakes
Dardanelles L
Showers L
Woods Lake
Frog L
Red L
50
89
88
4
N
T. 12 N.
T. 11 N.
T. 10 N.
R. 18 E.
R. 19 E.
120°00'00"
119°52'30"
Location of RNA
Principal access route

MAP 1
LOCATION AND TRANSPORTATION ROUTES
GRASS LAKE
RESEARCH NATURAL AREA
ELDORADO NATIONAL FOREST
LAKE TAHOE BASIN MGMT UNIT


NATIONAL FOREST
Tucker Flat
Creek
Freel Meadows
Thompson Peak
9340
Grass Lake
Creek
Lake
BM 7716
Luther Pass
7735
BM 7661
Waterhouse Peak
VABM 9497
Scotts Lake 8012
BM 7089
Fork
Pit
BM 7123
10
11
14
15
22
23
26
27
R18E
T11N
T10N
MAP 2
GRASS LAKE
RESEARCH NATURAL AREA
ELDORADO NATIONAL FOREST
LAKE TAHOE BASIN MGMT UNIT
Scale 1:24,000



MAP 3
VEGETATION
GRASS LAKE RNA
ELDORADO NATIONAL FOREST
LAKE TAHOE BASIN MGMT UNIT

Scale 1:24,000

RNA Boundary.....

Watershed Boundary ▬

LEGEND FOR MAP 3

GRASS LAKE RNA

Vegetation Types
(with Holland codes)

 Sphagnum Bog (51110) / Montane Meadow (45100)

 Lodgepole Pine Forest (86100)

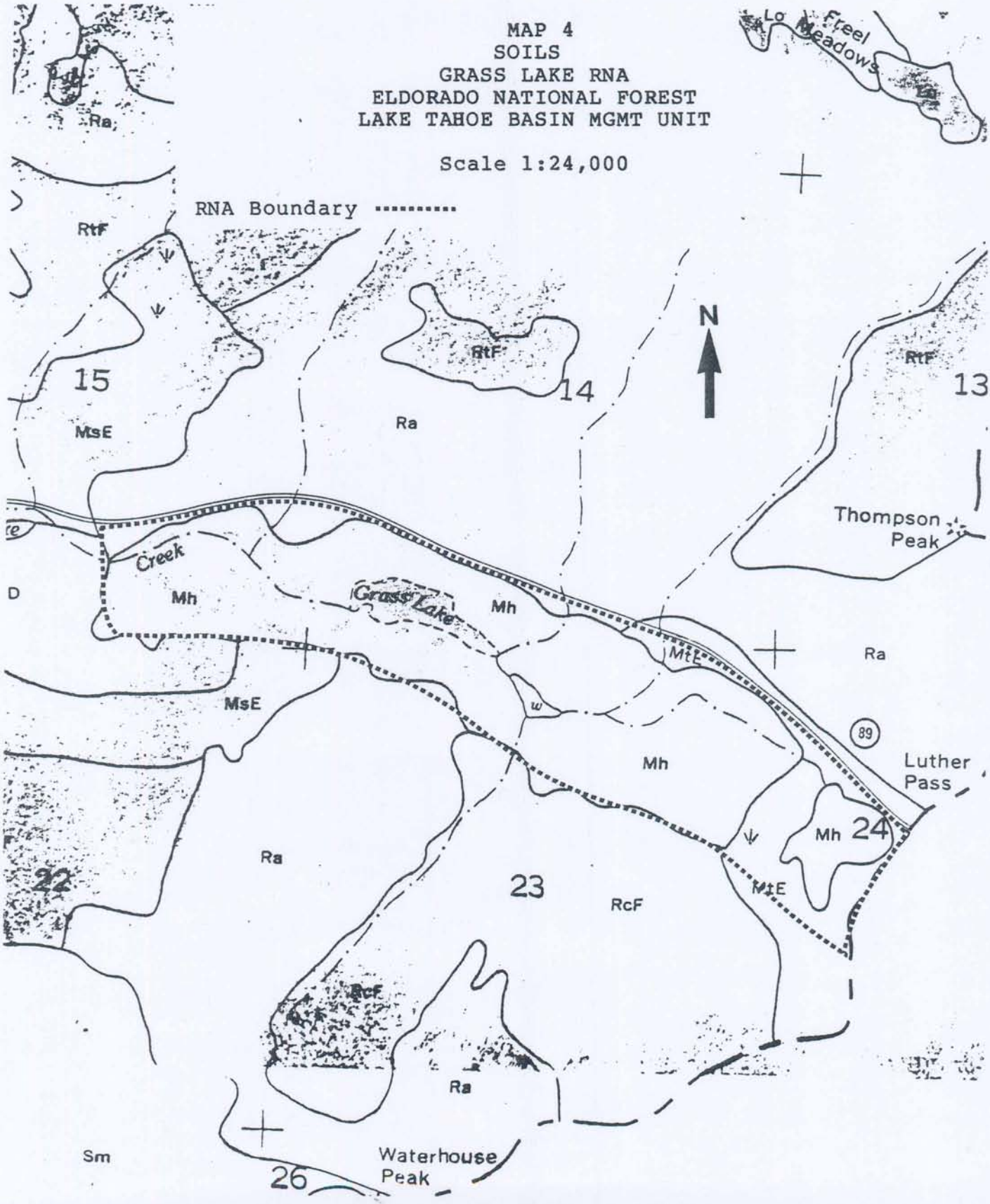
Jeffrey Pine Forest (85100)

 Red Fir Forest (85310)

 Aspen Riparian Forest (61520)

MAP 4
SOILS
GRASS LAKE RNA
ELDORADO NATIONAL FOREST
LAKE TAHOE BASIN MGMT UNIT

Scale 1:24,000



LEGEND FOR MAP 4

GRASS LAKE RNA

Soil Mapping Units

Mh	MARSH Grass Lake meadow and bog
MsE	MEEKS very stony loamy coarse sand, 15-30% slopes west end of Red Fir Forest
MtE	MEEKS extremely stony loamy coarse sand, 15-30% slopes Glacial moraine land bridge
Ra	ROCK LAND Jeffery Pine forest; much of slope of Red Fir Forest
RcF	ROCK OUTCROP-CAGWIN COMPLEX, 30-50% slopes Red Fir Forest, east end of north-facing slopes
RtF	ROCK OUTCROP-TOEM COMPLEX, 30-50% slopes more densely vegetated Jeffery Pine forest
TdD	TALLAC stony coarse sandy loam, 5-15% slopes west end of Grass Lake, low elevations

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER	DATE SUBMITTED
Ken Berg	3-5-91
HEADQUARTERS UNIT	**LOCATION**

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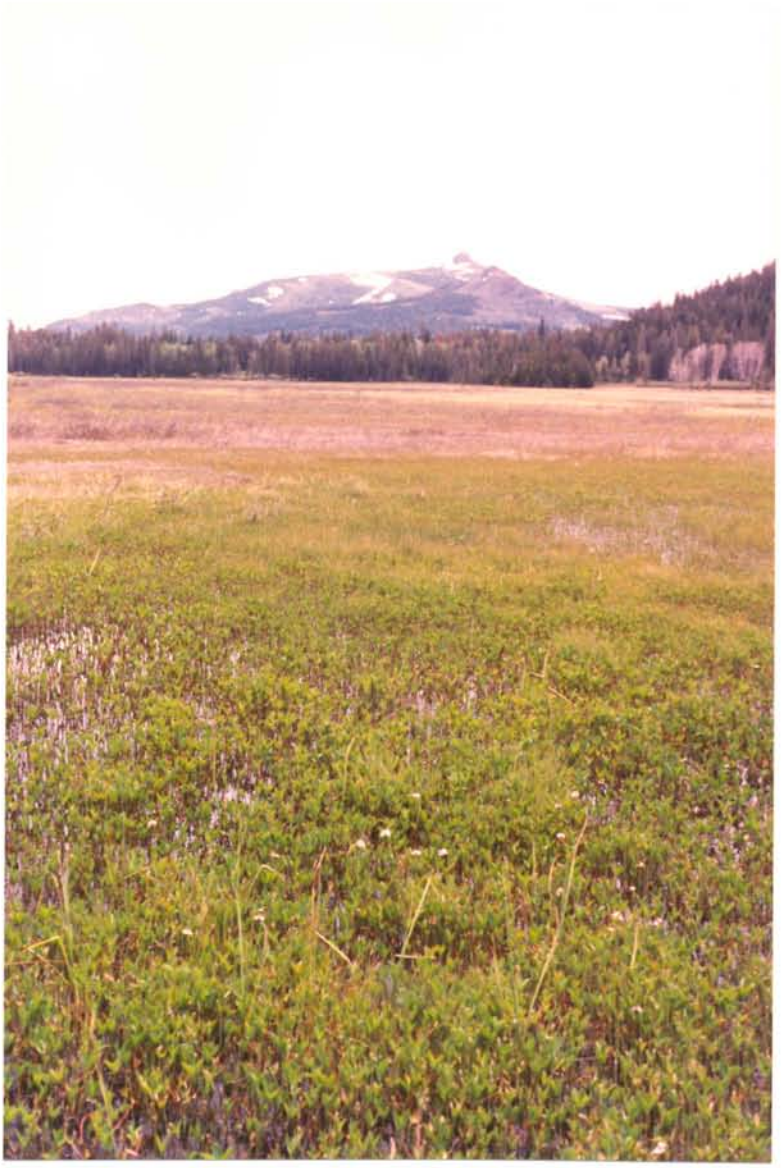
PHOTOGRAPH NUMBER		SELECTED FOR W.O. PHOTO LIBRARY	DATE OF EXPOSURE	LOCATION (State, Forest, District and County)	CONCISE DESCRIPTION OF VIEW	NEGATIV (Show si and BW b black and white or C for colo
TEMP. (1)	PERMANENT (To be filled in by the WO) (2)	(3)	(4)	(5)	(6)	(7)
			All: Jun '90	All: Calif., Lake Tahoe Basin Management Unit	Grass Lake RNA supports diverse sphagnum bog and wet meadow communities bordered by lodgepole pine forest The diverse meadows and wetlands of Grass Lake RNA support 9 recognized herbaceous communities that develop due to gradients in moisture, water chemistry and soil development. Grass Lake is open water in the mid-ground Buckbean (Menyanthes trifoliata) and sedge (Carex limosa) dominate the monkeyflower-short-sedge association. Typical sphagnum bog association which represents the target element for Grass Lake RNA Close-up of Sphagnum squarrosum, the sphagnum moss that dominates the archetypical quaking, sinking bog Shrubby riparian thickets dominated by Salix rigida intergrade with lodgepole pine forest along the edges of the wet meadow associations	All: 35mm color negs.

1. Grass Lake RNA supports diverse spagnum bog and wet meadow communities bordered by lodgepole pine forest. June 1990.

2. The diverse meadows and wetlands of Grass Lake RNA support 9 recognized herbaceous communities that develop due to gradients in moisture, water chemistry and soil development. Grass Lake is the open water in the midground. June 1990.



3. Buckbean (Menyanthes trifoliata) and sedge (Carex limposa) dominate the monkeyflower-shortsedge association. June 1990.

4. Typical sphagnum bog association which represents the target element for Grass Lake RNA. June 1990.

5. Closeup of Sphagnum Squarrosum, the sphagnum moss that dominates the archetypical quaking, sinking bog. June 1990.

6. Shrubby riparian thickets dominated by Salix rigida integrade with lodgepole pine forest along the edges of the wet meadow associations. June 1990.