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Wonderland Lake Area Study
OSMP Studies 4353

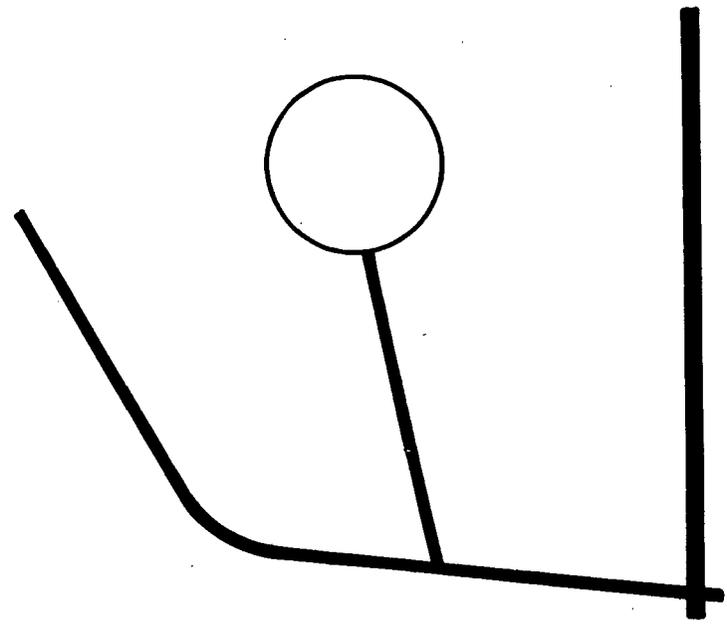
Study



Department of GeographyUnvers

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WONDERLAND LAKE AREA STUDY



Department of Geography
University of Colorado

WONDERLAND LAKE

AREA STUDY

DEPARTMENT OF GEOGRAPHY

UNIVERSITY OF COLORADO

Boulder, Colorado

1972

TABLE OF CONTENTS

	Page
CONTRIBUTORS	i
FOREWORD	ii
PART I ENVIRONMENTAL SURVEY	1
General Geology	2
Soils	3
Biologic Evaluation	6
Surrounding Upland	7
Eastern Drainage	7
The Lake Dam	7
Lake Perimeter Lowland	8
The Lake	8
Fauna	9
Summary	10
PART II LAND USE	11
PART III LAND EVALUATION AND TENURE	15
PART IV ALTERNATIVES, IMPACTS AND RECOMMENDATIONS	21
Alternative I	21
Alternative II	21
Alternative III	22
Recommendations	23
FOOTNOTE	25
ADDITIONAL REFERENCES	25
APPENDIX I	26

CONTRIBUTORS

Editorial Staff

Douglas Tiefel
Tom Harris
Mike Mirshab
Frank F. Drumm, Jr.

Part I Environmental Survey

Douglas Tiefel
Frank F. Drumm, Jr.
Mike Mirshab
Tom Harris

Part III Land Tenure and Evaluation

Webster H. Sill
Douglas Tiefel
Tom Harris
Frank F. Drumm, Jr.

Part II Land Use

Joyce Quinn
Mike Mirshab
Cliff Stockmeyer
Craig Hafner

Part IV Alternatives, Impacts and
Recommendations

Webster H. Sill
Craig Hafner
Mark L. Swanson
K-Lynn Keith

FOREWORD

This report on the Wonderland Lake area is one of three undertaken by the Department of Geography at the University of Colorado for the City of Boulder. The project was initiated by the students and faculty of Geography 540, Land Use Seminar, as a research study. Its purpose is to provide information for city and county officials and concerned citizens to assist them in planning the future development of the City and County of Boulder.

Payments of expenses and for materials for this report were made possible by a grant from the City of Boulder. The project was carried out through field investigation and library research by the students.

The study group would like to thank the following people who provided very helpful assistance and comments for our study:

Sanford Gladden, Boulder Historian

Paul Skwiot, City Land Officer, Advisory Committee on Open Space

Tom Powell, Assistant Wildlife Researcher, Colorado Division of
Wildlife

Libby Goodwin, Boulder County Park Planner

Doug Tiefel, Boulder County Planning Office, Seminar Participant

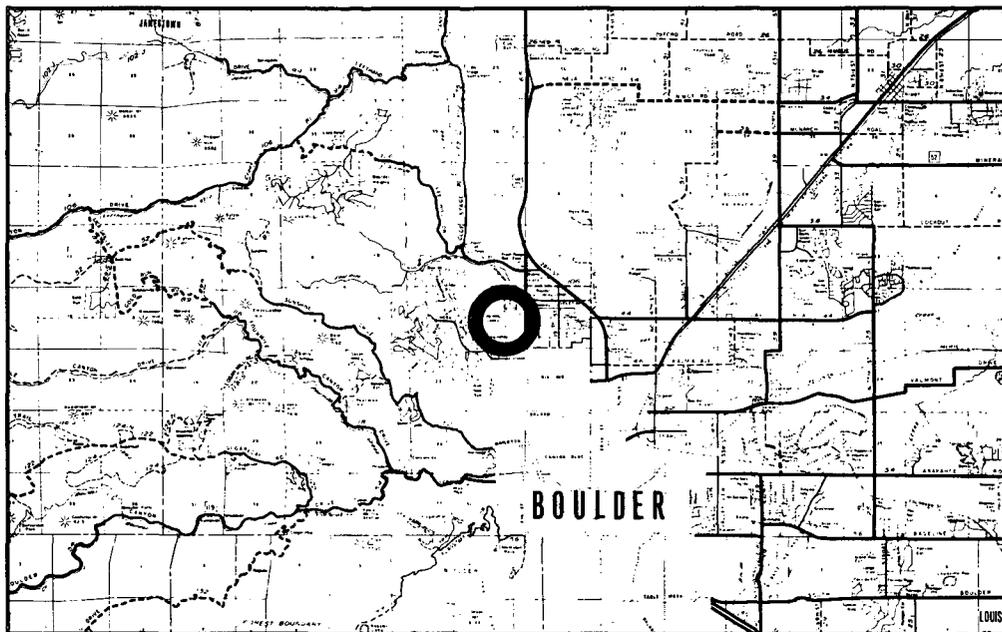
Special thanks to the personnel in the County Assessor's and Records Department for their patience and help during our long hours researching. Thanks also to Mary Axe for typing this report. A final note of thanks to Professor Donald D. MacPhail for his direction and encouragement in the research and preparation of this report.

The opinions expressed herein represent solely the conclusions of

the students in the seminar. Their viewpoints do not necessarily reflect those of the University of Colorado, of the Geography Department, or of the City of Boulder.

LOCATION MAP

MAP NO. 1



 WONDERLAND LAKE



Map No. 2 (photomap)



PART I

ENVIRONMENTAL SURVEY

Wonderland Lake is located in Section 13, Township 1 North, Range 71 West of the 6th P.M. The Boulder area is classified climatically as a semi-arid interior continental type. Geographically, the subject property is located immediately east of the Boulder Hogback, where the terrain rises dramatically. The lower half of this steep slope is generally treeless. The vegetation is described in the biological report of the area. Near the top of the hogback are a few single-family residences. The relief of the eastern slope of the hogback is comprised of small parallel ridges and valleys. This is due to erosion, weathering and runoff down the slope.

South of Wonderland Lake, open space separates Leach and Arnold's Linden Park Subdivision from the lake by approximately 1300 feet. Residence development appears to be near completion, and Leach and Arnold are planning no more new sites in the immediate area. Their plan is to leave the area surrounding the lake natural. This open space, with the exception of a few trees, is generally rocky, hilly grassland.

On the east end of the lake there is an earthen dyke which was built to increase the depth of the lake. The east side drops rather steeply into a gully that continues to drop in elevation until it runs into Broadway. The present land use of this valley is grazing for horses. To the south of this valley are seven residences along Quince Avenue.

North of the valley are single-family residences on Utica and Union Avenues. These areas very gently slope eastward toward Broadway. Immediately to the north of the lake around the shoreline are two single-family residences. According to one of the residents near the lake, the water

level of Wonderland is presently at an all-time low. Contributing factors to this situation are a high evaporation rate and very little run-in. Besides the natural water level in the area the only method of gaining water appears to be through Silver Lake Ditch, seepage, and precipitation. It is safe to assume that there is not enough runoff from snow and rain from the mountains to sustain an adequate water level. Apparently Silver Lake Ditch Company holds water rights to Silver Lake Ditch. In the past, water has been deterred before crossing into the subject property (at point A on drainage map).

Presently, there are only a few inches of water in the ditch and its flow is light. Point C of the drainage map shows the only present source of water intake by the lake. This intake is due to the efforts of Rex A. Scott who lives near the lake. He is diverting some of the ditch water through a small three-inch pipe. So it is evident that there is not enough water to sustain a high, normal water level, since at the present time there is no water running out of the lake.

Present access to Wonderland is very poor. Other than through private property to the north, the only other true access points are located at the intersection of Quince Avenue and a private north-south road from the Leach and Arnold Subdivision.

GENERAL GEOLOGY

Geology of the Boulder area can be considered the result of three major stages of development. First, the area was a broad, nearly flat surface composed of Boulder Creek granodiorite. On this surface the sedimentary rocks were deposited to a depth of several thousand feet. Second,

the present front range was formed by a broad uplift of the sedimentary units. Third, the sedimentary rocks forming this arch were stripped away by erosion, exposing the granite core and leaving steeply dipping sediment on each flank of the upward area. Bedrock in the Wonderland Lake area consists entirely of these sedimentary rocks.

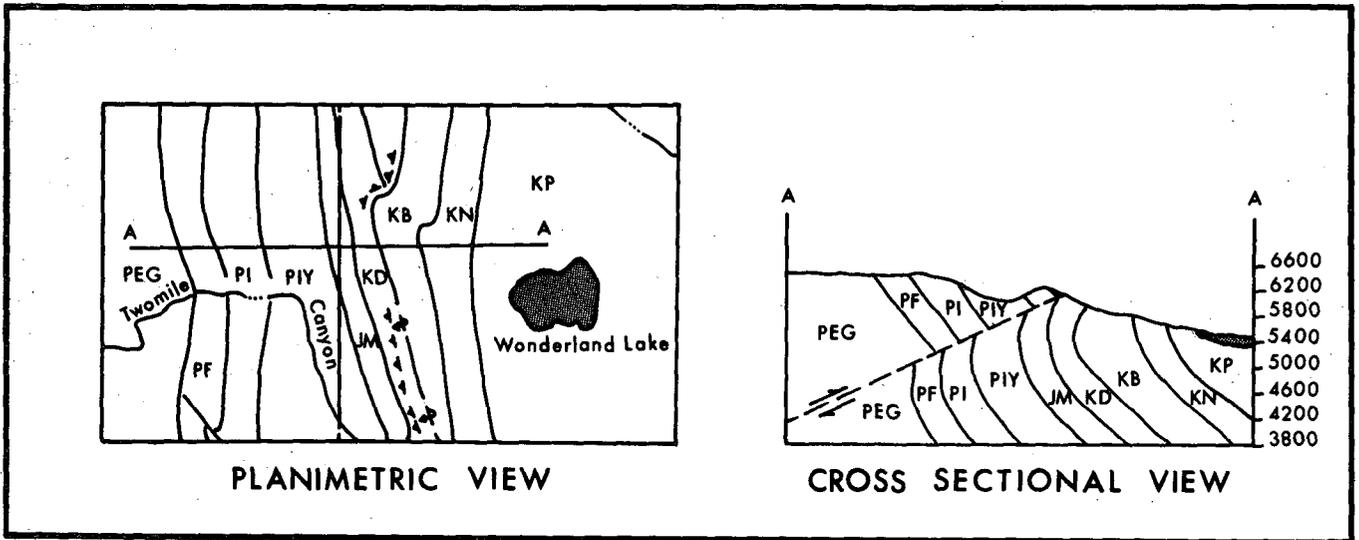
Wonderland Lake is located in Section 13, Township 1 North, Range 71 West of the 6th P.M. The area is geographically located immediately east of the Boulder Hogback and varies in a short distance from an elevation of 5,560 feet to an elevation of approximately 6,120 feet. This sharp rise is an expression of the eastern side of the Dakota Hogback which is composed of erosion resistant inter-bedded units of sandstones and shales dipping steeply east. The extreme western portion of the area lying between Wonderland Lake and the Dakota Hogback is underlain by the Benton formation while the remainder of the property is underlain by the Niobrara and the lower portion of the Pierre formations. These geologic units are composed predominantly of a dark grade fissile shale containing a considerable amount of expansive clays. Due to the incompetency of the shale units and the dip slope to the west of Wonderland Lake, several land slumps have occurred in the past. One of the major slumps in the area is immediately west of Wonderland Lake and encroaches almost on the lake itself. The area has a thin mantle of alluvial debris and weathered material.

Soils

There is no well developed soil profile in the Wonderland Lake area. Such soil as does exist is composed of:

GEOLOGICAL MAP

MAP NO. 3



PLANIMETRIC VIEW

CROSS SECTIONAL VIEW

- | | |
|------------------------------|------------------------------|
| KP Pierre Formation | PIY Lykins Formation |
| KN Niobrara Formation | PI Lyons Formation |
| KB Benton Formation | PF Fountain Formation |
| KD Dakota Group | PEG Granite |
| JM Morrison | |



1. A thin mantle of upland terrace gravels;
2. A poorly stored assemblage of Detritus which has originated from the dip slopes to the west; and,
3. Partially wetted and decomposed Pierre shale.

The Pierre shale contains modest amounts of expansive clays. However, the Benton formation which comprises the dip slope to the west of the Wonderland Lake contains a high percentage of swelling clays. In addition to the swelling problems associated with these expansive clays, the soil of Wonderland Lake area is highly alkaline. White deposits of alkali can be seen in almost all surficial depressions.

On the basis of information presented here, the major consideration at this site will be the slope stability. At the present time, in their natural state the slopes may be considered entirely safe and stable. However, extreme care will be necessary in all cuts, fills, slope angles, and drainage associated with developing potentials in the area. Special consideration should be given to foundation design for all structures.

The presence of highly alkaline material should be considered before irrigated landscaping of the area surrounding, as irrigation tends to concentrate the alkali at the surface with the net result that the lawns and shrubs would be destroyed. Sheet waste and local drainage of the area surrounding the lake may concentrate mineral contaminants in the lake itself which may be detrimental to life.

BIOLOGIC EVALUATION

Wonderland Lake is located within the Plains Grassland regional ecosystem just below the Grassland-Lower Montane ecotone. The vegetative

units which occur are basic structural responses to climatic control. This area has been actively influenced by man in the form of grazing, building, et cetera, which produces a definite sociological response of the vegetation, but always within the range of regional climatic control. Because the study area encompasses more than the lake itself, a separation into physiographic units should be helpful.

Surrounding Upland

This area is found mainly to the south and west of the lake. Mixed grasses and herbs prevail including grama grass (Bouteloua spp.) and buffalo grass (Buchloe spp.). Moderate to occasional occurrence of yucca (Yucca glauca Nutt.) and prickly pear cactus (Opuntia rafinesquei Engelm.) was noted. No attempt was made to identify the herbs as most were in the post-flowering condition. A high percentage, however, were within the family Compositae. Prickly lettuce (Lactuca scariola L.) was in profusion west of the lake. This is an introduced weed associated with soil disturbance. No unusual associations were noted in this area.

Eastern Drainage

This area exists below and east of the lake dam and extends to Broadway. The sides of the drainage have been very heavily grazed and offer no particularly interesting features. At the base of the dam, a substantial growth of sandbar willow (Salix spp.) is evident. Left alone, it should continue to spread easterly along the drainage.

The Lake Dam

This narrow band which forms the eastern edge of the lake is dominated by fairly mature willows (Salix spp.). In addition, a mixture of

weedy herbs and grasses are present on the east edge along with an occasional yucca (Yucca glauca Nutt.).

Lake Perimeter Lowland

This area is dominated by grasses. Foxtail barley (Hordeum jubatum L.), rabbitfoot-grass (Polypogon monspeliensis [L.] Desf.), Japanese brome (Bromus japonicus Thumb.), reed canary-grass (Phalaris arundinacea L.), and red-top (Agrostis gigantea Roth) which are among the common ones, lend themselves to an interesting pattern of zonation dependent upon different requirements. On the west edge of the lake is a substantial stand of Broad-leaved cat-tail (Typha latifolia L.). Bulrush (Scirpus spp.) and other sedges were found near the edge of the water. Cottonwood (Populus spp.) are scattered throughout the area with many young trees found concentrated in the vicinity of the shallow shore. This is indicative of the succession which is occurring.

The Lake

The lake itself is relatively shallow and rich in organic matter, both of which are related to its eutrophic condition. As lakes of this type mature, they may progress from shallow conditions through marshes or swamps and finally to dry land. The eutrophication process, which may lead to senescence, is a natural one, the rate of which depends upon the input of sediments and organic material. Some of this material in the form of sewage or other effluents may be the result of the presence of man. It is therefore doubtful that the lake will maintain its present state without management by man.

In addition to the vegetation which has been mentioned, various

forms of mosses and crustose lichens were found scattered throughout the area. The aquatic vegetation, owing to the shallow condition of the lake and resultant high degree of photosynthesis, is rather profuse. These particular flora should be given greater study in the near future, but at present the expertise of the study group does not allow for this.

Fauna

The animal life of the area is quite diversified and relates to the varied micro-environment and the creation of many niches. Mammals such as the mule deer (Odocoileus hemionus), red fox (Vulpes fulva), blacktail prairie dog (Cynomys ludovicianus), and muskrat (Ondatra zibethica) have been noted in the study area after only a few days of observation. It is very likely that an in-depth study will indicate more.

The avian life of the area is as abundant as it is diversified. The aquatic setting of the area provides a magnet in the semi-arid Boulder region for many species of waterfowl and assorted shore-birds. One member of the study team reported spotting over 200 waterfowl at the lake in one day. Of the more common species noted were the widgeons, teal, and mallards. Additionally, more extensive sightings have occurred by local bird clubs and individuals, and residents report up to 500 waterfowl have frequented the lake when the water level was normal.

Turtles and crayfish have been spotted at the lake; however, no attempt has been made to determine their actual populations. The Colorado Division of Wildlife and Fisheries Research Center plans to make a complete aquatic survey of the lake in the spring of 1973. No study has been made as to the presence of insects in the area, although interesting finds may

await the aquatic survey.

Summary

The Wonderland Lake area is biologically diversified and educationally stimulating. As a result of this diversification, a rich variety of wildlife within a relatively small area awaits the occasional visitor as well as the serious student.

Although the area has been substantially influenced by man, it is felt that through critical analysis of the biota and careful management practices, the area can maintain its unique character and provide exceptional aesthetic and educational experiences. In many cases species that once occurred naturally can be reintroduced or encouraged. The areas of predicted concentrated usage should be directed away from nesting and other fragile areas for obvious reasons. Boating of any type should not be allowed due to the impact of such activity upon the flora and fauna coupled directly with a relatively small area.

It is hoped that the above factors will be considered if the area is to be preserved for future generations.

PART II
LAND USE

When considering the present land use of the Wonderland Lake area, it is appropriate to consider briefly past land use of the area as seen through aerial photographic maps taken in 1938, 1956, and 1972. The 1938 photo map shows the area in a relatively undeveloped stage when compared to the one taken in 1972. Basically, the land appears to have been committed to agricultural pursuits; that is, there were three orchard plots just west of Broadway in the southeast part of the Wonderland Lake area. An unimproved road connected Wonderland Lake and Broadway. The rest of the surrounding area was used as open pasture land.

In 1956, definite trends toward development appear to have started. Originally, in the southwest end of the property, a small rectangular reservoir was developed. Secondly, several homes were built in the area just west of Broadway and east of the dam bank of Wonderland Lake. In addition, two new improved streets were constructed, running east to west from the lake area to Broadway. Finally, development around Wonderland Lake itself was started by a home being built on the north shore of the lake.

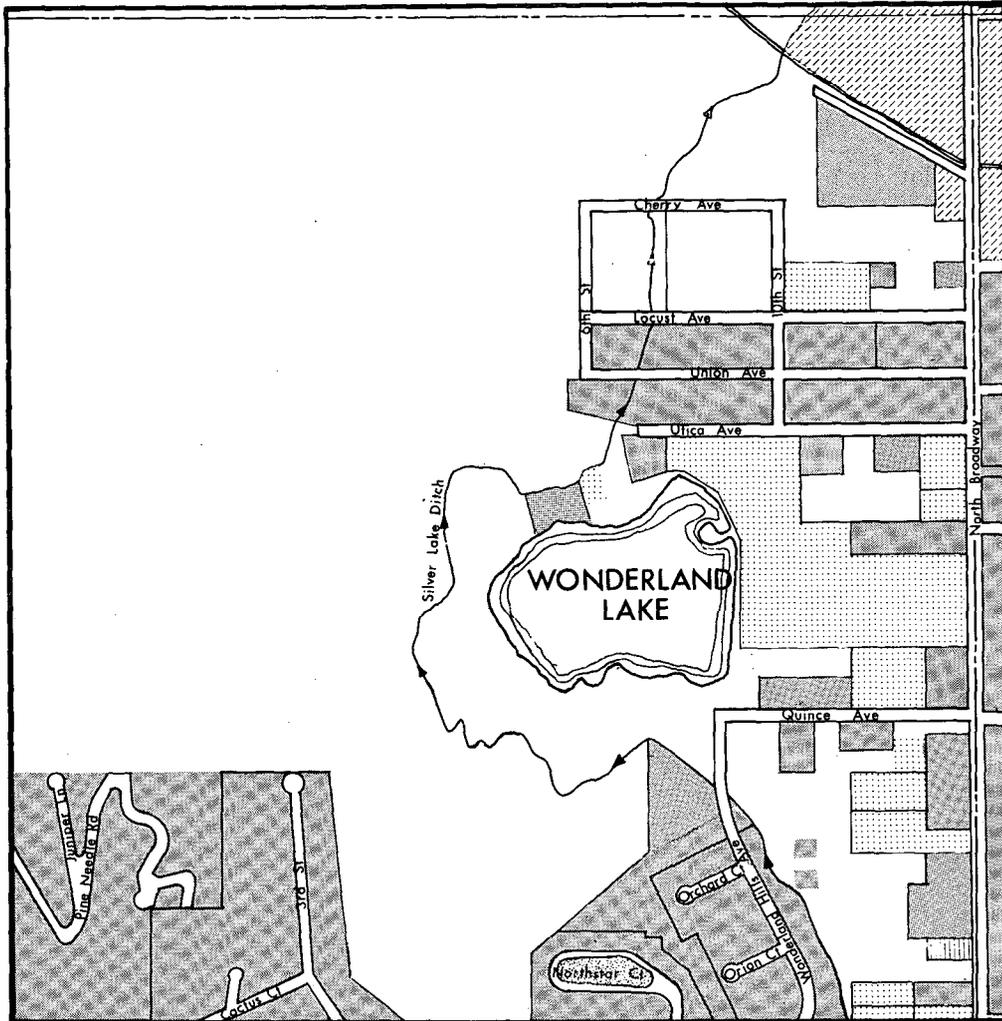
By 1972, the face of the area had changed dramatically as a result of the increased pressure of urbanization and subdivision development. First, the small rectangular reservoir was completely enclosed and covered. Two more east-west streets were developed west of Broadway and northeast of the lake area. These streets were built specifically to support a small subdivision development. In the very northeast section of the area, just west of Broadway, a mobile home development was placed, capable of support-

ing sixty-eight mobile homes. On the northwest side of the lake shore another residence, the Rex A. Scott home, was completed.

The most dramatic change in the area, however, was the subdivision development begun by the Leach and Arnold Company located on the south end of the property and also along the Hogback. The development has grown to such an extent that the subdivision is now within 1300 feet of the south shore of Wonderland Lake. The current land use of the Wonderland Lake area is shown by Map No. 4. The land use survey shows the encompassing nature of subdivision development.

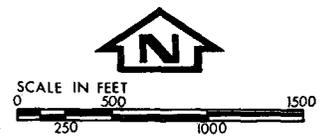
PRESENT LAND USE

MAP NO. 4



LEGEND

- | | |
|---|---|
|  Vacant |  Residential |
|  Agriculture |  Education Fac |
|  Commercial |  Recreation |



ZONING MAP

PART III

LAND EVALUATION AND TENURE

The area of this study is generally Section 13, Township 1 North, Range 71 West, although the entire section is not covered. The following pages probably contain more information on land and tenure than is necessary to determine a bidding price. However, this information may lead to an understanding of the extensive and recent growth in the area, and the possibility of future trends.

The section can be divided into two parts: residential lots, generally small in area, can be found in the eastern and southern portions of the section, and land in the northern and western portions, much of which is owned by the City of Boulder. Property values vary widely within the section. The price per acre reflects the desirability of land for building sites. Generally, undeveloped land is more valuable than comparable agricultural land farther from the city.

Though the City of Boulder owns a significant portion of the section, three remaining areas may yet interest the city. These are: 1) Wonderland Lake; 2) the Dunn property (see attached, 21 and 22) east of the lake; and 3) the 28 acres due west of the lake (see attached, 52).

The city presently holds an option on the Wonderland Lake property. Since lake property is not assessed by the county, it is hard to judge its value prior to buyer/seller contact. The Dunn property is flanked by residential areas, and therefore will be expensive. Though expensive, this small valley seems a natural extension of the open space idea. Without city purchase, further development of this property can be expected. ALA

Partnership holds the land due west of the lake. If the city were to purchase this land, the price per acre would be much higher than the land immediately west of it which was recently purchased by the city. The prime residential character of this land will make it expensive and difficult to obtain. The following table and map (Map No. 6) illustrate the land ownership and values in Section 13.

TABLE 1

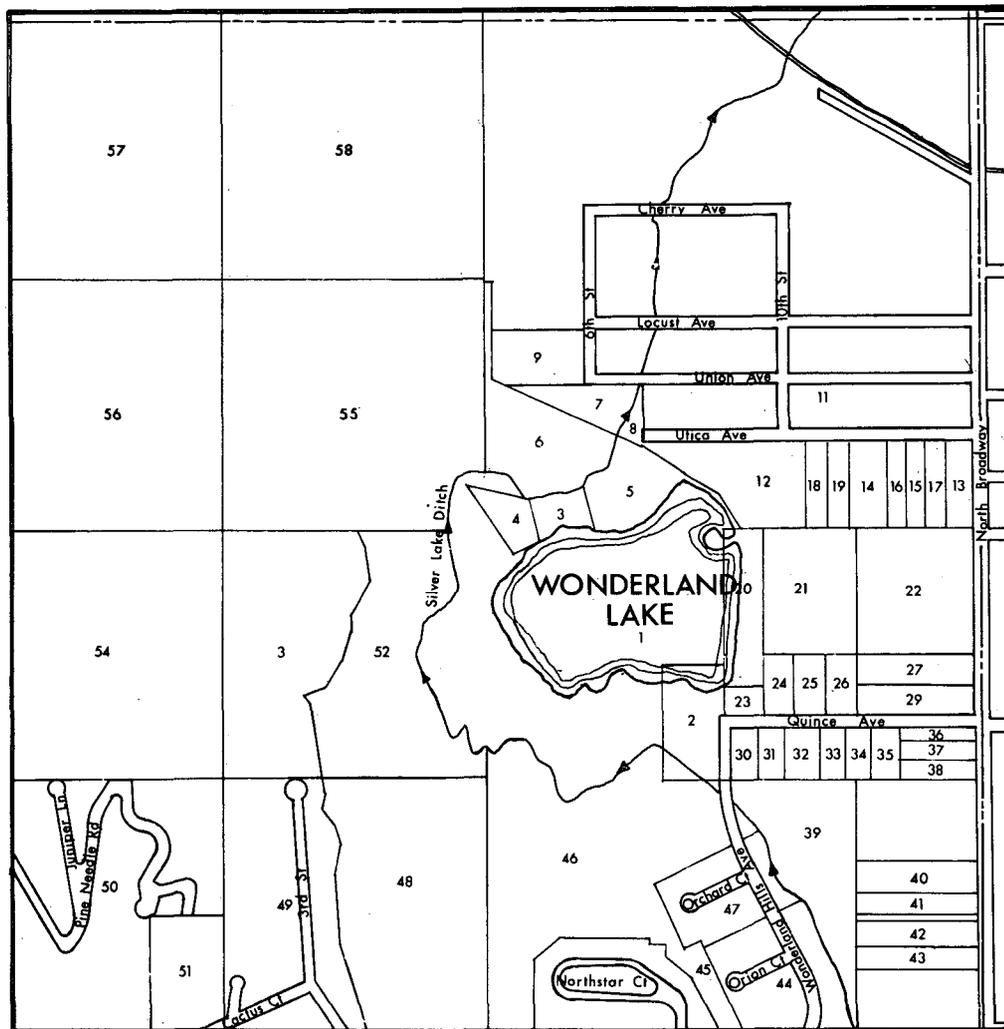
Land Ownership and Value in Section 13, T1N, R71W

<u>Section Designation</u>	<u>Boulder County and City Designation</u>	<u>Owner</u>	<u>Acres</u>	<u>Real Value per Acre</u>
NW ⁴ SE ⁴	1) Wonderland Lake	Leach & Arnold	56.37	
	2) 2025	ALA Partnership	4.2	1050.
	3) 2296 less A	"	.67	1340.
SW ⁴ NE ⁴	4) 2296A & 3085	Rex H. Scott	2.2	9950.
	5) 2070	ALA Partnership	3.6	3150.
	6) 1762	"	3.6	210.
	7) 1754N	Beverly Ann Short(1/8) Glen Short (3/4) Robert F. Short (1/8)	1.0	22800.
	8) 1754N1	Philip W. Raveling	1.0	17600.
	9) 1754R	Boulder County	3.5	
	10) 1754	Carrie P. Sheets	4.0	9530.
	11) 1754	Sheet Subdivision	9.29	41700.
	12) 1764	ALA Partnership	4.6	952.
SE ⁴ NE ⁴	13) 1764A	Allen T. & Velma J. Parrish	1.89	13880.
	14) 1764B	Dean R. & D. A. Lauer	2.0	3610.
	15) 1764C	E. R. & D. Long	1.0	11420.
	16) 1764C1	"	1.0	9300.
	17) 1764C2	B. E. & Pearl Barr	1.0	14590.
	18) 1764D	G. F. & Wilma Smysor	1.12	13740.
	19) 1764E	"	.82	2680.
NE ⁴ SE ⁴	20) 1760	ALA Partnership	3.0	1245.
	1761			
	21) 1755	Anna Lee Dunn	8.75	
	22) NE ⁴ NE ⁴ SE ⁴	"	10.0	830.
	23) 1761	Joseph C. Young	.69	2130.
	24) 1758A	Frances H. Snyder	1.06	25320.
	25) 1758	Charles D. & B. Roberts	1.46	14740.
	26) 1758B	James T. Sacamamo	1.06	16270.
	27) N ² N ² SE ⁴ NE ⁴ SE ⁴	John H. & C. Staphens	2.5	10950.
	28) 3299 (or) S ² N ² SE ⁴ NE ⁴ SE ⁴	National State Bank (Trustee)	2.5	5970.
	29) S ² N ² SE ⁴ NE ⁴ SE ⁴	ALA Partnership	2.5	3270.
	30) 1757C	A. A. & R. M. Ebel	1.0-	2670.
	31) 1757F	"	1.0-	2670.
	32) 1757D	C. Wayne & K. McDuffie	1.17	12470.
	33) 1757G	A. A. & R. M. Ebel	1.0-	2200.
	34) 1757E	Lois M. Bastrom	1.0-	19410.
	35) 1757B	E. L. & J. M. Sater	1.14	11710.
	36) 1757	F. C. & L. L. Hendee	.7	3140.
	37) 1757A1	D. O. & Mary A. Miller	1.0	9760.
	38) 1757A	Kurt & Elizabeth Wolf	1.0	15850.

SE ⁴ SE ⁴	39) 1756	A. A. & R. M. Ebel	40.0	250.
	40) N ² S ² NE ⁴ SE ⁴ SE ⁴	ALA Partnership	2.5	3260.
	41) 2947 & 1763	Jarrow School Inc.	2.98	
	42) 1768	Clarence W. & Florence E. Richman	2.0	9060.
	43) 1998	L. A. & A. L. Durward	2.4	8400.
	44) Wonderland Hills			
	45) West of Ditch, City of Boulder		6.6	
SW ⁴ SE ⁴	46) SW ⁴ SE ⁴ less Wonderland Hills	"	21.2	
	47) Wonderland Hills #2	Albireo Investment Co. (19 lots), Leach & Arnold (1 lot), A. & M. L. Sinyder (1 lot) R. & R. Pershacker (1 lot), K. & F. & S. Smith (1 lot)--total	6.85	5930.
SE ⁴ SW ⁴	48) SE ⁴ SW ⁴	Albireo Investment Co.	24.51	
	49) SE ⁴ SW ⁴ (west)	Spring Valley Est.	15.49	
SW ⁴ SW ⁴	50) SW ⁴ SW ⁴ less E400' of S600'	Pine Brook Hills #6	34.5	
	51) E400' of S600'	Spring Valley Est.	5.51	
NE ⁴ SW ⁴	52) E ² NE ⁴ SW ⁴	ALA Partnership	28.0	(not taxed sale 1972)
	53) W ² NE ⁴ SW ⁴	City of Boulder	12.0	
NW ⁴ SW ⁴	54) NW ⁴ SW ⁴	"	40.0	
SE ⁴ NW ⁴	55) SE ⁴ NW ⁴	"	40.0	
SW ⁴ NW ⁴	56) SW ⁴ NW ⁴ less 4036 & 4036A	"	38.0	
NW ⁴ NW ⁴	57) NW ⁴ NW ⁴	"	40.0	
NE ⁴ NW ⁴	58) NE ⁴ NW ⁴	"	40.0	

OWNERSHIP - VALUATION *

MAP NO. 6

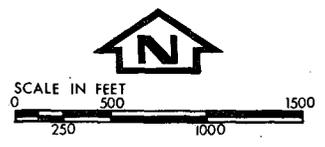
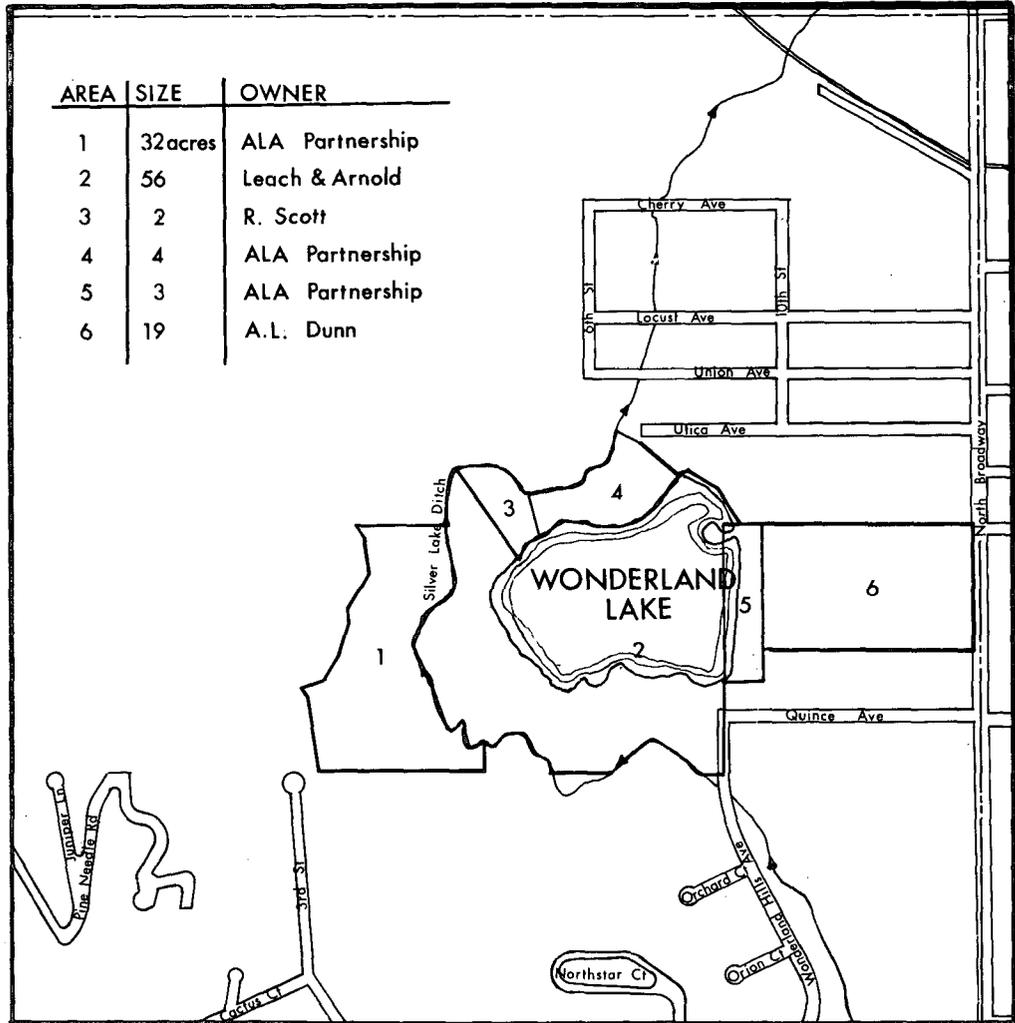


* Numbers correspond to Table 1



PROPOSED LAND USE

MAP NO. 7



PART IV

ALTERNATIVES, IMPACTS AND RECOMMENDATIONS

A study of the Wonderland Lake area leads to a number of possible alternatives. Much of the area's future has been determined by development. However, a limited and vital area remains open to land use options. In the following paragraphs three alternatives are advanced and examined. The recommendations of the Study Group follow the alternatives.

ALTERNATIVE I

The first alternative is a "hands off" policy, the city allowing private development to take its course. If this policy is followed, the Wonderland Lake area will be developed. Area #1 (see Map No. 7), due to its prime location, will be developed first. This area will contain expensive homes, overlooking the lake, within the near future. Areas #5 and #6 (see Map No. 7) will develop slowly. This area, below the dam, is a valley and somewhat marshy. However, area #6 borders Broadway and may in time become a commercial strip development. Areas #3 and #4 (see Map No. 7) already have residential units. Area #2, Wonderland Lake, will probably continue to exist as a lake. However, the possibility of filling and residential development sometime in the future cannot be overlooked.

A modified Alternative I would be city purchase of Wonderland Lake. If this course were followed, the lake would be maintained. Yet, with only this land purchase there would be no public access to the lake. In effect, it would become a private lake for the immediate residents, maintained at public expense.

ALTERNATIVE II

The second alternative is city acquisition of areas #2, #4, #5, and

#6. These areas will prove less expensive than the properties #1 and #3. Under this plan, areas #5 and #6 could serve several purposes. The city could develop a community center, public buildings, or an intensive recreational center. Areas #4 and #2, generally Wonderland Lake, would prove useful as a moderate use recreational site. Fishing and picnic grounds seem a natural use for this space. Purchase of the above properties also has the advantage of linking these areas with the large expanse of open space to the north and west, an area recently purchased by the City of Boulder. This would allow citizens to gain access, via city property, to the city-owned hogback.

A modification of Alternative II would be the purchase of only areas #5 and #6. Acquiring this land would allow the city an option in the North Boulder area for a future civic or recreational site.

ALTERNATIVE III

Alternative III is the acquisition of all lands surrounding Wonderland Lake. This alternative depends upon the ability to acquire property #1, then in turn properties #2, #5, #6, #4, and #3. Area #1 will be very expensive due to its prime nature as a site for residential development. Areas #3 and #4 will be somewhat difficult to obtain since each property has a residential unit on it. However, #3 and possibly #4 can be dropped from this alternative without too much damage until some future time when this property becomes more available.

This alternative is basically a progression of recreational lands. Area #1 would become a limited-use recreational area. This property is part of the hogback and complements that portion of the hogback presently

owned by the city. A limited number of bridle and hiking trails, in conjunction with other city-owned open space, would be excellent utilization of this land. Areas #2, #3, and #4 would serve as a moderate-use recreational area, possibly for fishing and picnicking. Areas #5 and #6 would again be useful as places of intensive use for recreation. Use of this land may develop along several lines.

RECOMMENDATIONS

The Study Group recommends Alternative III, the purchase of all lands around Wonderland Lake (Map No. 7). Area #1 is of prime importance. This land constitutes part of the hogback. If it were allowed to develop, this area would be extremely visible from any direction. Residential development on this property would scar the natural beauty of the hogback. Anything that detracts from the aesthetic value of the foothills would also detract from the aesthetic value of Boulder. When this land is acquired by the city, it will have been put to its most beneficial use--visual aesthetic satisfaction.

In the event that Alternative III is rejected by the city, the Study Group lists the following specific recommendations:

- 1) That the city reject purchase of Wonderland Lake unless able to acquire either property #1 or properties #5 and #6;
- 2) That if Wonderland Lake is purchased, it not be deepened in the immediate future. Money, at present, is better spent on land acquisition;
- 3) That if Wonderland Lake is purchased, an inflow/outflow drainage be immediately established via Silver Lake Ditch;
- 4) That if development takes place on the hogback (property #1), the city

move to increase the minimum lot size, and enforce height limits;

5) That if development takes place on the hogback, and the city buys Wonderland Lake, the city enforce some type of runoff controls on the developers and lot owners, thus maintaining water quality in Wonderland Lake.

If any of the above alternatives is accepted which allows for public fishing, the Colorado Division of Wildlife, under agreement with the City of Boulder, could manage the lake for a warm water fishery. This would include largemouth bass, sunfish, and channel catfish. Depending upon ice safety conditions, a winter fishery utilizing rainbow trout could also be established and maintained. Furthermore, the Division states that "this type of management on similar lakes currently supports approximately 1,000 to 1,500 fishing trips per acre per year."¹

FOOTNOTE

- 1 Letter from Colorado Division of Wildlife, Fisheries Research Center

ADDITIONAL REFERENCES

William A. Weber of the University of Colorado Museum

Robbie Elliot of the Boulder Bird Club

Tom Powell, Fisheries Research Center, Colorado Division of Wildlife

Jane Bock, Department of Biology, University of Colorado

Map sources

United States Geological Survey--Boulder Topographic Quadrangle, 1957

Boulder County Road Map, 1971

Boulder County Base Map, 1965

APPENDIX

APPENDIX I
A PARTIAL LIST OF BIRDS SPOTTED AT
WONDERLAND LAKE OVER A PERIOD OF TWO DAYS

Mallard (Anas platyrhynchos)
American Widgeon (Mareca americana)
Canvasback (Aythya valisineria)
Shoveler (Spatula clypeata)
Pintail (Anas acuta)
Redhead (Aythya americana)
Green-winged Teal (Anas carolinensis)
Blue-winged Teal (Anas discors)
Water Pipit (Anthus spinoletta)
Great Blue Heron (Ardea herodias)
Killdeer (Charadrius vociferus)
Wilson's Phalarope (Steganopus tricolor)
Ring-billed Gull (Larus delawarensis)
Franklin's Gull (Larus pipixcan)