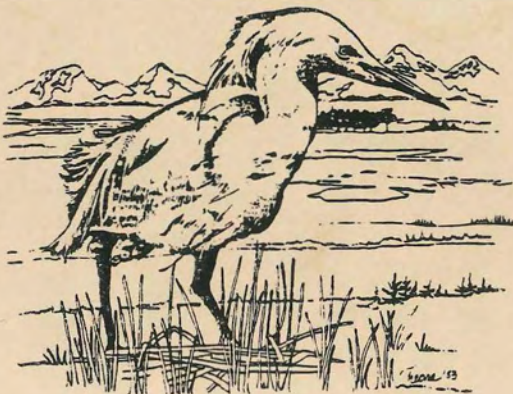


Approved by South Suburban
Board of Directors
March 30, 1983

—South Platte Park—



FINAL MASTER PLAN

SOUTH PLATTE PARK

FINAL MASTER PLAN

PLANNING TEAM

CITY OF LITTLETON

JON V. PAYNE
Director of Planning

SOUTH SUBURBAN METROPOLITAN RECREATION AND PARK DISTRICT

MARY WEBER-QUINN
South Platte Park Supervisor

H. WM. WOODCOCK
Manager of Planning

GORDON B. GREENWELL
Manager of Public Safety
and Visitor Services

SOUTH PLATTE PARK STAFF, 1982
Ann Carney Vincent Gracyzk
Michael Pettit Martha Wetsel

SUPPORT STAFF
Susan Anderson, Graphics
Karen Bay, Typing



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INTRODUCTION

Introduction

The essence of South Platte Park was determined at its conception. In response to the proposed channelization of the South Platte River, the residents of Littleton demanded a change in federal law in an effort to retain the natural beauty of the Platte River Valley. Today, 12 years later, as the result of the work completed by countless people, the park has been purchased in its entirety and represents a dream turned reality.

In keeping with the original dream, we are proud to present the Master Plan for South Platte Park. The guidelines and recommendations outlined in the previously accepted conceptual plans have been followed whenever possible and modified when deemed necessary by changes in the resource. However, the basic premise of a natural, passive area remains and we have tried to capture the essence of a natural river valley and develop an innovative method of management for such a fragile area. This Master Plan represents a balance between visitor use and preservation of the resource. Areas of high use, moderate use, and low use have been delineated in an effort to allow for visitor opportunity while providing an undisturbed area for a wildlife retreat.

Management of the park is presently the responsibility of South Suburban Metropolitan Recreation and Park District as designated in the management agreement signed on April 19, 1983. Therefore, any reference to the "managing agency" in the text of this Master Plan refers to South Suburban Metropolitan Recreation and Park District.

Planning Process

South Platte Park has been the subject of several studies prior to the involvement of South Suburban Metropolitan Recreation and Park District. The DeBoer study of 1966 indicated the need for large open spaces and a natural corridor along the South Platte River. The concept of preserving natural river bottom was again discussed in the Barlett study in 1973. The first conceptual master plan for South Platte Park (Littleton Floodplain Park) was completed under contract by Rogers-Nagel-Langhart, Wright-McLaughlin Engineers, and Interplan of Denver in 1975. In addition to outlining conceptual ideas for acquisition, financial phasing and potential development, it clearly indicated the passive recreation in a natural setting as the best use of the area.

In June, 1982, South Suburban Metropolitan Recreation and Park District was contracted by the City of Littleton to begin management of South Platte Park while concurrently collecting information necessary for the final phases of the master plan. A behavioral approach was adopted by the planning team in which specific topics of study were given to each team member. Inventories within the assigned topics were carried out in the study area noted in Figure 1. Previous studies were reviewed and resource data were updated while working closely with the City of Littleton staff in an effort to keep the planning and management within the previously accepted goals for the area. At the conclusion of the inventory period, resource data, demand information and constraints on the area were compiled and reviewed. An overlay system was used to obtain the most accurate integrated data. Subsequently, goals for management were determined, alternatives were generated and the review process began.

The review process entailed several phases. The first consisted of a review of the goals, objectives, and general recommendations by the City of Littleton staff, South Suburban staff, Littleton City Council and the South Suburban Board of Directors. Changes and additional recommendations were incorporated and compiled with the support data as a preliminary master plan. The preliminary plan was presented and reviewed during a study session of the Littleton City Council and South Suburban Board of Directors, held on February 22, 1983. Following review and study by the governing bodies, the preliminary plan was revised, distributed to affected agencies, and placed in five locations for review by the public. (See Appendix I for details.)

The final phase was a public hearing held on March 30, 1983 (transcripts in Appendix II). The master plan was adopted by the South Suburban Metropolitan Recreation and Park District Board of Directors on March 30, 1983, and by the Littleton City Council on April 19, 1983.

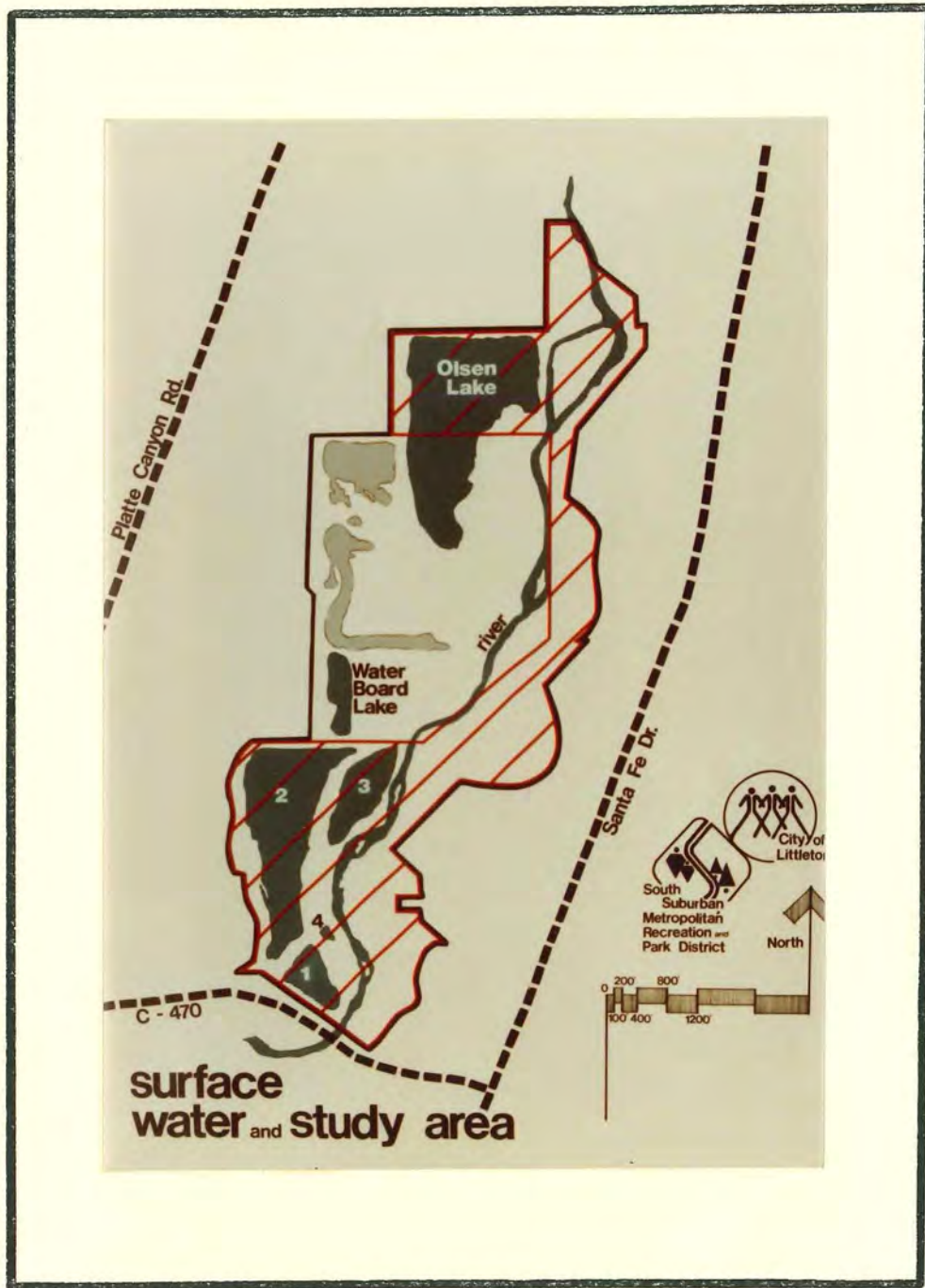


Figure 1: MAP OF STUDY AREA AND WATER RESOURCES

**SUMMARY OF
RECOMMENDATIONS**

Summary of Recommendations

The overall recommended theme for South Platte Park entails a quiet, natural area where individuals can relax and enjoy a natural resource close to their homes.

Four goals have been outlined for the park management:

1. Maintenance of the floodplain.
2. Renovation and preservation of the resource.
3. Provision of environmental education opportunities.
4. Provision of limited leisure opportunities.

The master plan has been presented as two alternatives. Alternative No. 1 deals with the existing resource. Alternative 2 deals with the proposed Ken Caryl crossing through the central portion of the park. Both alternatives are preceded by two phases of development to renovate the resource and provide visitor use areas prior to the completion of the mining operation (1994).

Both alternatives include recommendations for:

- A. Vegetation management, including barrier plantings, groundcover and willows for stabilization and forage, and cottonwood groves for cover and aesthetics.
- B. Wildlife management, to include habitat enhancement programs and the provision of a wildlife retreat with low visitor use, in the southwest section of the park.
- C. Visitor access points from a limited number of designated pedestrian trails and one vehicle access point off Santa Fe Drive.
- D. Trail development to include a two mile north/south trail connecting to the Platte River Greenway Trail and several shorter, experiential trails.
- E. Lake use limited to fishing and non-motorized boating on specified lakes.
- F. Use of positive public education as the primary visitor management tool.

- G. Construction of a visitor/education center to serve as park headquarters, visitor information center and shelter for classes, workshops, and so forth.
- H. Construction of an approved river crossing.
- I. South Suburban Metropolitan Recreation and Park District to be responsible for the management and operations of the park.

GOALS AND OBJECTIVES

Goals and Objectives

GOAL NO. 1. To preserve and maintain the defined floodplain according to the Federal guidelines outlined in the agreement between the City of Littleton and the State of Colorado (October 13, 1977) which safeguards the community from the potential flooding danger of the South Platte River.

OBJECTIVES

1. To implement the most practical management methods while maintaining compliance with the U.S.A.C.E. standards as defined in Design Memorandum Volume I and II and as stated in the floodplain regulations prescribed by the Secretary of the Army, Title 33, Chapter II, part 208.
2. Monitor the resource and report any events or changes in the resource which would require additional U.S.A.C.E. management recommendations.
3. Actively seek the recommendations and approval of the U.S.A.C.E. for all construction projects undertaken in the park.

GOAL NO. 2. To manage the resource as a natural ecosystem while maximizing the restoration of natural habitat areas for indigenous species.

OBJECTIVES

1. To implement the most practical resource management methods to minimize the impact of all park improvement or construction projects.
2. Design and implement an adequate reclamation/revegetation program to provide wildlife habitat, visual enhancement, soil stabilization and definition of visitor travel routes.
3. Manage the park to provide maintenance and regeneration of the riparian ecosystem.
4. Implement the most appropriate enhancement programs, management techniques and regulations to assure wildlife propagation, population stabilization and protection.
5. Implement the most appropriate enhancement programs, stocking programs and regulations to develop a "quality" fisheries resource.
6. Actively seek the recommendations of County or State specialists prior to the implementation of herbicide control programs for noxious or undesirable plant species.

7. To monitor, document and evaluate wildlife residents, migrations and behavior to determine population needs and to provide management and background information for interpretive programs.
8. To develop and maintain a cooperative working relationship with the Colorado Division of Wildlife.

GOAL NO. 3. To provide environmental education opportunities on a regional level.

OBJECTIVES

1. Provide in-service training and/or orientation for teachers wishing to use the park resource for group education experiences.
2. Develop and/or help to coordinate the development of standardized and customized curriculum materials for environmental education programs.
3. To implement a permitted scheduling system to limit group size, number of groups and the level of use of the park resource.
4. To monitor and evaluate the level of impact caused by group educational use and take appropriate management steps to minimize that impact.

GOAL NO. 4. To provide limited leisure opportunities on a regional level.

OBJECTIVES

1. Encourage discovery of opportunities for passive recreation within the limitations of the resource.
2. Establish adequate regulations to provide for visitor safety and minimal impact on the resource.
3. Design an adequate trail system to minimize off-trail impacts and to protect fragile resource areas.
4. Provide adequate information through signage and brochures on regulations and passive opportunities within the park.
5. Provide an information/education center to serve as an information dissemination location.
6. Provide self-guided and naturalist-guided interpretive activities as needed.
7. Monitor and evaluate the level of impact caused by visitor use and take appropriate management steps to minimize that impact.

**RESOURCE
INVENTORY**

Historic and Cultural

The cultural and historical inventory discussed in this report includes all of the existing South Platte Park and the adjacent land between Santa Fe Drive and Platte Canyon Road, from Colorado 470 to approximately Coal Mine Road. The study area and significant points of historical interest are noted in Figure 2.

ANTHROPOLOGICAL CONSIDERATIONS

Colorado was probably one of the first areas inhabited during the passage of the last Ice Age when the Wisconsin Sheet covered most of the eastern part of the North American Continent. There is evidence that there was an open corridor along the eastern slope of the Rocky Mountains where small groups of nomadic hunters were able to roam the plains. These first migratory people from Asia probably crossed the Bering Straits and followed the coast and later crossed over into these areas.

Previous studies completed within the inventory area have failed to produce any evidence of dwellings or other artifacts. In 1974, archeologists from the University of Denver surveyed approximately 300 feet on each side of the present banks of the river and located no significant archeological sites. The Colorado Department of Highways, during their South Platte River Crossing Environmental Impact Assessment, determined that in the areas involved, "No archeological resources were recovered, and it is unlikely that any significant surficial resources are present", probably due to the highly disturbed nature of the area.

EARLY EXPLORATION

Long's Expedition

Major Stephen Long, a topographical engineer, was sent by President James Monroe to explore the southwestern boundary of the Louisiana Purchase. Referred to as the "Yellowstone Expedition" (though it never reached the Yellowstone area), it was the first scientific expedition to cover the land from the Missouri River to the source of the South Platte, Arkansas, and other rivers present in Colorado and New Mexico.

Nineteen men on horseback followed the east side of the Platte River through the present park area to the canyon, over to the valley of

the Arkansas River to Pike's Peak and finally, out of state. The party would have passed through South Platte Park around the Fourth of July, 1820. The team of scientists included: biologist Edwin James (historian of the trip), zoologist Thomas Say, and landscape painter Samuel Seymour.

Following his explorations, Stephen Long endorsed Zebulon Pike's earlier concept of the "Great American Desert": "I do not hesitate in giving the opinion that it is almost wholly unfit for cultivation and of course, uninhabitable by a people depending upon agriculture for their subsistence." Long was later highly criticized for his opinion of Colorado's farming potential.

RAILROADS

The discovery of gold by William Green Russell at the mouth of Dry Creek in 1858 opened up the Platte River Valley to gold-seekers and homesteaders. This brought many changes to the valley, including the arrival of railroads to move the ore out of the mines and supplies into the small towns. The trains also provided passenger and commuter services on most routes. Many of these railroads were narrow gauge due to the terrain they penetrated, with the rails placed only three feet apart to enable the train to negotiate sharper curves and steeper grades.

Later, a third rail was added to allow standard trains to travel certain routes and as the narrow gauge rails became outdated, they were removed. Today, only a few narrow gauge rails are still in operation in Colorado, and function primarily as tourist attractions.

Denver, South Park and Pacific Railroads

A survey completed in 1868 envisioned a railroad going from Denver to Santa Fe. The Denver, South Park and Pacific route did not fulfill that dream, but another one, that of Governor James Evans. The route went south out of Denver, turned up Platte Canyon following the mountain over Kenosha Pass, across South Park, and down Trout Creek to the Arkansas River.

The tracks ran west of the South Platte River and east of what is Platte Canyon Road. The Denver, South Park and Pacific merged in 1898 with the Union Pacific Railroad to become the Colorado & Southern Railway until 1939. Shortly thereafter, the rails were removed.

Denver and Rio Grand Railroad

On October 28, 1871, William Jackson Palmer founded the Denver and Rio Grand Railroad, the first rail to cross the Colorado mountains. The Rough and Ready Mill, farmers, and other businesses utilized the railroad to transport their goods to cities to the south and ultimately to Kansas City via connections. The railroad also offered passenger service with an estimated travel time of five hours to Colorado Springs. These rails, lying east of Santa Fe Drive, are still operational on many routes today.

RESIDENTIAL

Wolhurst Estate (Historic Marker 67)

The Wolhurst Estate, with acreage covering land in both Douglas and Arapahoe Counties, was built by Colorado Senator Edward O. Wolcott in 1891. The grounds were covered with mature cottonwoods and the lavishly decorated house was highlighted by the 60 foot long library and billard room. The estate was known for extravagant entertaining events and both political and historical meetings. In 1898, ten thousand people attended a benefit for Spanish American War soldiers on the estate.

After Wolcott died in 1905, the wealthy Thomas F. Walsh bought the estate, enlarged the lake and built a road around it. President Taft and many other high society figures from Denver were entertained by this family. He sold the estate in 1910 to Horace W. Bennett and his father-in-law, Jerome S. Riche.

Bennett turned to dairy farming and increased the acreage of the estate to fourteen hundred acres while acquiring more water rights. He produced crops to help maintain the 250 milk cows and poultry that he raised. Many improvements were made to the house and the surrounding buildings during this period and when Bennett died in 1941, the property was returned to the open market.

In 1944, Elijah Stephens, better known as "Smiling Charlie", purchased the estate and seven hundred and fifty additional acres. "Charlie" was a well known gambler and ex-convict and established the Wolhurst Saddle Club, a club known best for its gambling but also offering horseback riding. After a fire destroyed the original rooms of the house on February 18, 1951, Eddie Jordon, "Charlie's" son-in-law, rebuilt the house, took over the club and legalized its activities.

On March 29, 1976, the Wolhurst era ended when a massive fire consumed the entirety of the structures. Today, a trailer court occupies the grounds where the estate buildings once stood.

Doerfer House (4600 Coal Mine Road)

In 1907, two brothers, Jacob and Joseph Doerfer, built the house and lived there with their sister Catherine. Apparently unaltered through the years, the structure is the best example of a turn of the century farm house in the Littleton area. It is now under the protective status of the National Register of Historic Places.

From 1902 to 1907, the Doerfers farmed a piece of property one mile west of Platte Canyon Road and lived on the property until their deaths. When Jacob died around 1935, the property was sold to Margaret Hildebrand. The Hildebrand family still owns the property.

INDUSTRIAL USES

Irrigation

One of the most historical ties people have with the Platte River is that of economics. The river was a source of livelihood for both miners and farmers, which led to major problems concerning the allocation and distribution of the water.

In 1895, a petition was introduced before the Kansas legislature to provide water to the communities along the Platte. The legislature, which was governmentally responsible for the area, approved an act for the incorporation of the Capitol Hydraulic Company. This was the beginning of what is now known as the City Ditch, which was determined eligible for the protection of the Register of Historic Places on December 13, 1979.

Engineered by John M. Clark, the ditch encountered immediate design problems. He had designed a flat ditch which impeded the flow of the water and the company folded before the construction was completed. At this point, the Platte Water Company assumed responsibility for the project.

A second design problem was recognized when the water flow began its 37 mile route into Denver. The Company had neglected to take into consideration the distribution of water within the city. The water from the irrigation canal was used to plant trees and lawns in Denver and create Smith Lake in Washington Park. Meanwhile, farmers were

diverting water to their fields all along the upstream route. Stephen Long's "Great American Desert" was slowly shrinking away while wheat, barley, oats, hay, corn, potatoes and sugar beets were replacing the barren fields.

In the spring of 1874, the Nevada Ditch and Holding Company was incorporated. The Nevada Ditch, located on the west side of South Platte Park and parallel to City Ditch is now the west boundary of the park. Supplementing Last Chance Ditch, its major purposes were to provide water for irrigation, manufacturing and mechanical needs.

The State of Colorado developed an irrigation law which was recognized and followed by other arid Western states where water shortage was even more serious:

"In the beginning the very simple idea was evolved that the first one to make beneficial use of the water had the better right. This simple rule is the fundamental rule and the foundation of the irrigation law. Second and also fundamental is that to protect the latter against the earlier. Therefore, it was early provided that water should not be wasted or used excessively."

Later this would become the "Doctrine of Prior Appropriation" water law.

Rough and Ready Mill

In 1867, the first steps toward Littleton becoming a village were undertaken by Richard S. Little, L. A. Cole, John G. Lilley, Jesse Estlack, Joseph Bowles and others, by buying the Rough and Ready Mill. The mill was located on the corner of Santa Fe and Bowles Avenue, harnessing the power of the Platte through the upper portion of City Ditch. The ditch was enlarged and properly renamed the "Rough and Ready Mill" Ditch.

The mill's flour was known in Boston and New York as well as Denver. It was the product of this mill that brought attention to the superior qualities of Colorado's flour. The majority of the wheat was harvested within a ten mile radius of Littleton.

The first of three fires struck the mill in 1872. The mill was rebuilt and burned again two years later. Reconstruction was undertaken, this time with stone and new equipment which processed five hundred bushels of wheat per day. In 1959, another fire consumed the mill beyond repair. Today, a gas station stands on the mill site at Bowles and Santa Fe and renovation of the area is projected in the Littleton Riverfront plan.

Gravel and Sand Mining Operations

Peter Kiewit Sons' Co. conducts a gravel operation on approximately 200 acres west of Nevada Ditch, adjacent to the park boundary. Since their primary business is construction, the amount of removal from the Louviers Alluvium depends solely on the contract needs.

Cooley Sand & Gravel Company, another family operation, began in 1955 on the west bank, one mile downstream from Colorado 470. This area was later reclaimed as Chatfield Golf Course. Initial reclamation began in 1960, which included wheat farming with little success. In 1965, the operation was moved to 75 to 100 feet from the river. Severe flooding on June 16 and 17, 1965, caused failure of protective embankment on the south end with similar failures of inner dikes, resulting in complete flooding of the gravel pits.

Mining by Cooley continues in the park area under a lease agreement and is projected to continue until 1994.

FLOOD CONTROL

Major floods occurred in the area of the South Platte in 1844, 1933, 1935, 1942, 1965, and 1973, and represented two types of flooding. Those of high peaks and short duration were in 1844, 1933, 1935, and in 1965. The floods of 1942 and 1973 resulted from high spring rains during peak snow melt, causing long duration flooding with intermediate levels of waterflow.

The United States Congress approved plans for Chatfield Dam in 1950, but because of negative public response no funds were appropriated for the Army Corps of Engineers to begin construction. On June 16, 1965, the Platte River reached the highest recorded level of 110,000 cubic feet per second, and resulted in property damage and the contamination of most of the Littleton drinking water supply.

Recognizing that the flood probably could have been prevented if the dam had been constructed, the public reaction to the dam became more positive and in 1967, funding was appropriated. The Corps then began construction of Chatfield Dam, at twice the estimated cost of 1950. In 1973, Chatfield Dam was not yet completely enclosed and the residents of the valley saw the South Platte River at a level that it would hopefully be at for the last time.

The Littleton Floodplain Project

The Littleton Floodplain Project began with a U.S. Army Corps of Engineers flood control project in 1971. They proposed the channelization

of the South Platte River downstream of the Chatfield Dam, including two miles of scenic riverside land upstream from Littleton, a town of 30,000 people. The City of Littleton took on a grassroots approach to modify the Army Corps of Engineers plan. By the time it was completed, the campaign had escalated to the national level and produced precedent setting legislation which enabled the Army Corps of Engineers to contribute funds to local governments for the purpose of purchasing floodplain property for open space within the community.

The idea of "non-structural" floodplain management is not new to Colorado. The concept was first discussed by Fredrick Law Olmstead, a Harvard Landscape Architect brought to the State by Boulder City Improvement Association in 1910. Olmstead discussed natural waterways and the floodplain park concept in the Front Range...

"...the plan of keeping open for public use near the heart of the city a simple piece of pretty bottomland of the very sort that...has been flooding over the countless centuries, of growing a few tough old trees on it and a few bushes and of keeping the main part of the ground as simple open common where children can play and over which the wonderful views of the foothills can be obtained at their best from the shaded paths and roads along the embankment edge--this would give a piece of recreation ground worth a great deal to the people and at the same time it is probably the cheapest way of handling the flood problem."

However, Littleton's proposal of a non-structural means of preventing flood damage provided a major change in the Army Corps of Engineers traditional method of controlling flood waters. By keeping development out of the floodplain, not only are flood damages drastically reduced, but the community is provided with scenic riverside parks.

The concept of the Floodplain Project was conceived in 1971 when the City Manager, Larry Borger, sensed the community's negative reaction toward the proposed channelization. It was the responsibility of the City Council to approve the plan and allocate the funding necessary for acquisition, but final approval for the project required convincing the Army Corps of Engineers that the Floodplain Park would accomplish their goals of diminishing the flood threat to the community.

On November 2, 1971, the citizens of Littleton approved a \$400,000 bond issue with a clear 2-to-1 margin in the highest election turnout in the community's history. This represented the local monies necessary for acquisition and was matched with federal grants from the Bureau of Outdoor Recreation's Land and Water Conservation Fund

and the Housing and Urban Development Legacy of Parks Fund. With half of the necessary funds appropriated, the emphasis for additional funding was focused on the Army Corps of Engineers and the State of Colorado.

The Littleton Floodplain Project not only required the funds approved for the channelization by the Army Corps of Engineers, but the \$200,000 the State had secured for the project as well. Acquiring the State funds took time, but the State Legislators did approve the measure. The final stage was set in Washington on March 7, 1974, when Public Law 93-251, The Water Resource Development Act of 1972, was signed by President Richard Nixon.

Public Law 93-251 states:

"The project for flood control...on the South Platte River...is hereby modified to authorize the Secretary of the Army...to participate in the acquisition of lands and interests therein and in the development of recreational facilities...in lieu of the authorized channel improvements for the purpose of flood control and recreation."

The Littleton Floodplain Project won the highest award from the Rocky Mountain Center on Environment for "defending and enhancing the environment on the part of the local government." As a result of the initiative of the City of Littleton, all federal agencies must now consider non-structural alternatives in the planning and design phases of flood control projects.

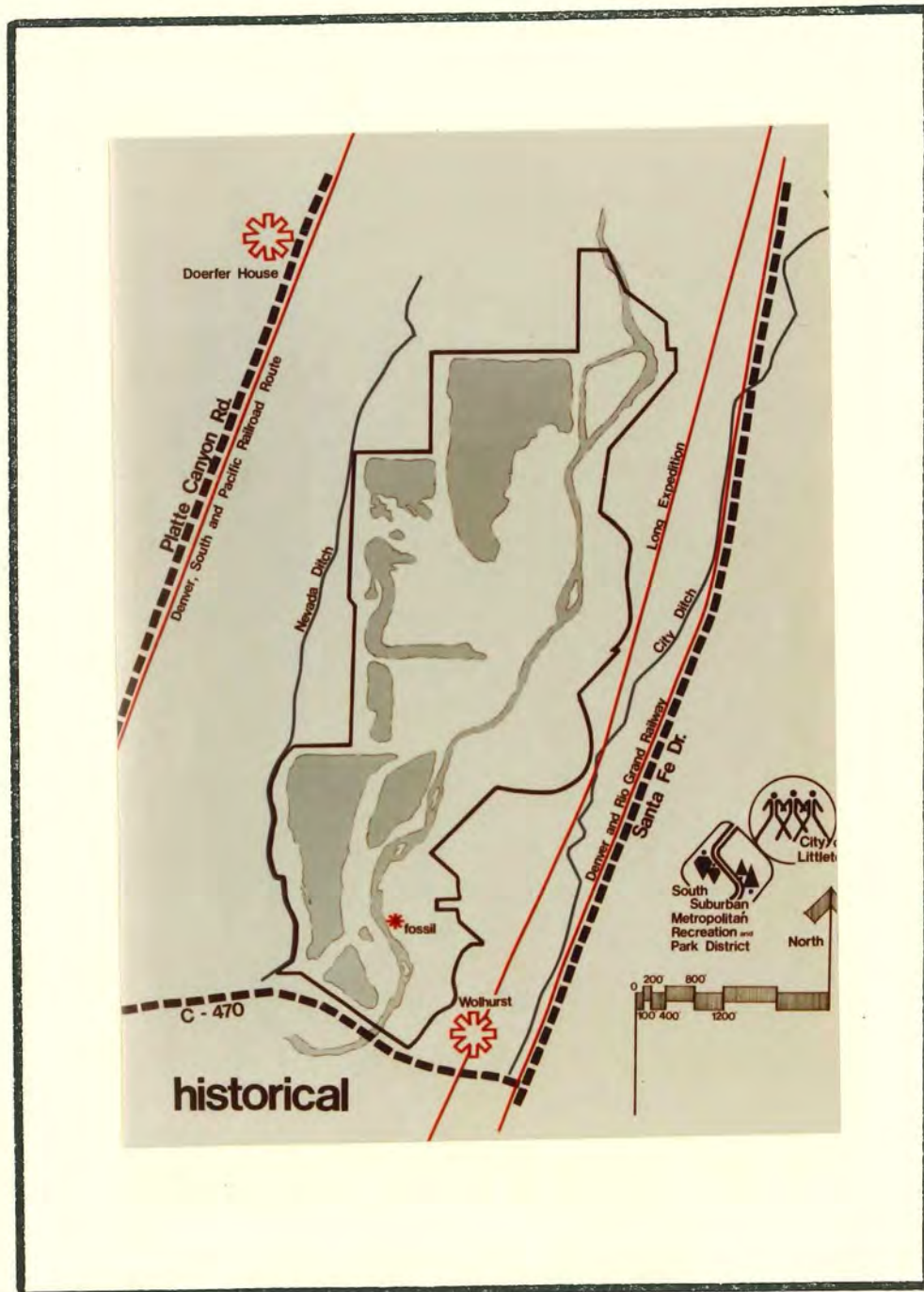


Figure 2: MAP OF HISTORIC RESOURCES

Climate

DESCRIPTION

The climate of South Platte Park is continental. Separated from any moisture source by several mountain ranges, the park experiences low relative humidity, low average precipitation, moderate winds and much sunshine.

Air masses from at least four different sources influence the weather: Arctic air from Canada and Alaska, warm air from the Gulf of Mexico, warm dry air from Mexico and the Southwest, and Pacific air modified by its passage over coastal ranges and other mountains to the west. The prevailing winds occur from a southerly direction and between May 1 and September 30, 29 percent of the time those winds are over 25 miles per hour.

The climate at South Platte Park is largely a result of its location at the east slope of the Rocky Mountains in the belt of the prevailing westerlies. Cumuliform clouds shade the area during most summer afternoons so that temperatures of 90 degrees or more are reached on an average of only 33 days of the year.

The high altitude and location of the mountains to the west combine to produce moderate temperatures during the winter season. Invasions of cold air from the north, intensified by the high altitude, can be abrupt and severe. However, many of the cold air masses that spread southward out of Canada never reach this altitude but move off over the lower plains to the east. Chinook winds often raise the temperatures far above normal when surges of cold air from the west are moderated in their descent.

In spring when the outbreaks of polar air are lessening, they are often met by moist currents from the Gulf of Mexico. These two currents produce the rainy season in the park, which is the wettest, cloudiest and windiest season. Much of the 37 percent of the annual total precipitation that occurs in spring falls as snow during the colder, earlier period of that season. Stormy periods are often interspersed with stretches of mild, sunny weather. The rainy season reaches its peak in May.

Summer precipitation (about 32 percent of the annual total) usually falls from scattered local thunderstorms during the afternoon and evening. Mornings are usually clear, warm and sunny.

Autumn is the most pleasant season at South Platte Park. Local summer thunderstorms are mostly over and invasions of cold, severe weather are infrequent. During this season there is less chance of cloud cover than

at any other time of year. Precipitation amounts to about 20 percent of the annual total.

Winter has the least precipitation accumulation of any season and almost all of it is snow (11 percent of the annual total). There are more cloudy days and the relative humidity averages are higher than in autumn. Weather can be quite severe, but as a general rule the severity doesn't last long.

IMPACT ON THE RESOURCE

Precipitation

Two factors affect the streamflow of the Platte River through the park: (1) the amount of precipitation and (2) the regulation by Chatfield Dam. Should excessive flooding occur from precipitation, the clayey-sandy material of the steep channel banks will erode and slip. The eroded sediment reduces light penetration in the stream, limiting its productivity. Destruction of vegetation along the river banks also causes increased water temperature, limiting the habitability by certain fish species. Debris deposited during flooding could alter the channel course and cause new areas of destruction.

Amounts of precipitation will directly affect the water level in the lakes. Marsh areas bordering the lakes are of interest because of their need for moisture and importance as waterfowl habitat.

Temperature

Extreme temperature departures from the normal will affect the vegetation within the park. During a very cold winter season, wildlife will consume greater amounts of buds and seedlings in concentrated areas. New spring growth will have a later start when the temperature is colder than usual.

Wind

The mid to southerly section of the park is highly disturbed and the gravelly-sandy soil is susceptible to wind erosion. As material is blown from these areas it may be necessary to plant trees and shrubs or provide a mulch cover.

Strong winds can also cause uprooting of trees and removal of branches. Providing the downfall does not block trails or cause visitor hazards, this can be a good form of wildlife habitat.

Geology

PROFILE

The Littleton Quadrangle includes 56 square miles of the eastern slope of the Front Range, south of Denver. The area lies in the South Platte River drainage basin which, with its tributaries, shaped most of the land forms.

The oldest terrace, Verdos Alluvium (Qv) in the immediate area of the park dates back to the late Cenozoic period. The Cenozoic period was a time of uplift followed by the erosion of high-level surfaces, slight uplift, pedimentation, alluviation, erosion, wind deposits and development of soils. Three pediments were cut and are overlain respectively by Rocky Flats Alluvium, Verdos Alluvium (containing volcanic ash), and Slocum Alluvium.

Five alluvial fills were deposited in channels cut through pediments. They are Louviers, Broadway, Pre-Piney Creek, Piney Creek, and Post-Piney Creek Alluviums.

DESCRIPTIONS

Louviers Alluvium

These are well developed terraces with a graded bedding of contorted silt and clay layers exhibiting iron and manganese oxide stains. The alluvium is composed of dark or moderate yellowish-brown, fine-grained, pebbly silt in the upper five feet. There are alternating beds of light grayish-brown, fine-grained, micaceous, pebbly sand and cobbles in the middle ten feet and thick beds of cobbles, pebbles, sand and some clay in the lower 15 feet.

The alluvium could be as much as 70 feet thick since the gravel pits along the South Platte Park extend to between 30 and 40 feet below the water level. The stones are sub-angular to sub-rounded, ranging to 18 inch boulders with 1/2 inch pebbles being predominate. The major constituents are granite, quartz, mica, feldspar, ironstone and welded tuff. Minor components are chert, sandstone, quartzite, negatite and gneissic rocks.

Piney Creek Alluvium

Located east of South Platte River, the Piney Creek Alluvium is composed entirely of sand. Quartz is the predominant mineral, but meta-

morphic and igneous rocks are common in the pebble layer. Derived principally from the sheet erosion of the soil covered slopes, it was deposited in previously cut arroyos along the stream and plains.

Post-Piney Creek Alluvium

The Post-Piney Creek includes the alluvium in both the youngest terrace and in the floodplain. It consists of grayish-brown loesse, well stratified fine sand and medium sand. The sand is composed of primarily quartz, but also contains layers of magnetite. The thickness of the deposit is twelve feet or less and averages approximately four feet.

DISCUSSION

The initial landforms in the vicinity of the park were created by the recession of the Wisconsin Glacier. These landforms were then carved by small streams during eight geomorphic cycles. Each cycle included the following physical processes in chronological order: downward stream cutting, sideward stream cutting, alluviation, wind erosion and deposition, and then development of soils. These processes represent a natural response to a constantly changing climate.

Fossils are abundant in some Quaternary deposits. Louviers Alluvium contains many large vertebrate fossils and fresh water mollusks. Bison bones were discovered (see Figure 2), and the lower jaw of Mammuthus was found by Edward French and Darrell Blech in the river bottom. The major fossil discoveries have taken place in the Post-Piney Creek Alluvium. The significance of such discoveries dictates that careful observation and possible excavation for additional fossils take place in any areas that are disturbed through construction, erosion, or any other means.

Soils

SOIL ASSOCIATION

A soil association refers to the combination, pattern and landscape form of the soils that exist in a particular area. This information is useful in determining general resource management guidelines but should not be used for specific planning such as site selection for construction. An on-site investigation should be completed since slope, drainage and other characteristics may vary within an association.

The Alluvial Land, Nunn Association, covers the entirety of South Platte Park. It is comprised of nearly level, mainly loamy, sandy soils on floodplains and terraces. There are three main components to this type of association.

Loamy Alluvial Land: Nearly level and subject to occasional flooding. Its deep, dark-colored, stratified loam and sandy loam have recently been deposited.

Sandy Alluvial: Occurs next to major stream channels and is frequently flooded. It consists of nearly level, deep, light-colored sand.

Nunn Soils: Occur on terraces which are not subject to flooding and are comprised of a deep, loamy surface layer and a clay loam or clay subsoil.

SOIL DESCRIPTIONS

Since a large percentage of the park has been subject to gravel extraction since 1971, it is necessary to discuss the soil description in two parts. The first is a description of the soils present prior to mineral extraction and the second is a description of the soil after the mining operation. (See Figure 3 for map.)

Soils Prior to Mineral Extraction

Edgewater Series (EdB)

These are poorly drained soils occurring on the bottom land of the South Platte River. The soil is moderately deep over gravel that developed in the loamy material deposited by water. EdB soils have moderate available water holding capacity and free water is usually

found within four feet of the surface. The soil is likely to be flooded when streams are at flood stage.

Profile: The surface layer is dark grayish-brown loam that is free of lime and about 18 inches thick. It is underlain by 10 inches of grayish-brown, noncalcareous sand clay loam streaked with iron. Below is waterworn gravel, mainly feldspar and granite.

Wet Alluvial Land (Wt)

This type of soil occupies nearly all of the level areas next to stream channels and will usually flood each spring. Wet Alluvial Land is often wet below a depth of three feet and is sometimes wet at the surface.

Profile: Generally, the soil material is dark colored and occurs in thin layers ranging from loam to sand. The material extends to four feet or more, becoming more sandy with depth.

Mapping includes small areas of Edgewater Loam, Loamy Alluvial or Sandy Alluvial Land.

Terrace Escarpments (Tc)

This is often found next to streams and drainages having vertical banks cut by erosion. Erosion is mainly due to water and presents a severe hazard. Typically, soil slipping and sloughing will be present.

Profile: The soil material is deep, clayey to sandy, and is generally stratified and calcareous.

Mapping includes small areas of Loamy Alluvial Land.

Gravelly Land (Gr)

This occurs on side slopes above major drainageways in the western three-fourths of Arapahoe County. The slopes range from 6 to 50 percent.

Profile: It is variable, but commonly, the surface layer is sandy loam or gravelly loam two to four inches thick. The next ten to twenty inches consist of a sandy loam or gravelly clay material. The gravel is mixed with some silt and sand below the depth of three feet.

Heldt Clay (H1B) - 0 to 3 percent slope

This type of soil consists of deep, nearly level to gently sloping soils on uplands and stream terraces. The Heldt series develop from material deposited by wind and water. The soil is hard to work and run-off is rapid because the water intake is slow.

Profile: In the typical series, the surface layer is grayish-brown, lime-free clay about four inches in depth. The subsoil is grayish-brown clay or silty clay about 19 inches thick with lime in most places. (It is very difficult for roots to penetrate this horizon.) Underlying it is light olive-brown, stratified sandy loam to clay with lime to depth of 54 inches or more.

Nunn Loam (N1B) - 0 to 3 percent slope

This series is comprised of soils that are deep, well drained, level or nearly level. They are developed by wind and water deposited material. These soils have moderate permeability and high available water holding capacity.

Profile: This is typical of the series with a surface layer of grayish-brown, noncalcareous loam about three inches in depth. The subsoil ranges in color from dark grayish-brown clay loam at surface, to grayish-brown light clay in middle section to grayish-brown sandy clay loam below. The subsoil is non-calcareous and about 19 inches thick. Underlying it is light brownish-gray sandy loam and stratified sand and loam extending to 60 inches in depth. This material ranges from slightly calcareous to very strongly calcareous.

Areas Subjected to Gravel Mining and Extraction

West of the river, most of the Edgewater Series and some of the Wet Alluvial Land was disturbed due to gravel extraction. Little to no topsoil replacement took place in the reclamation process and at present there appears to be minimal topsoil development occurring.

The dominant material consists of an aggregate sand and gravel mixture. The vegetation has begun to establish itself but growth is slow due to a lack of mineral soil for nutrients. As a result, very little plant residue has accumulated on the surface.

A major change in the landscape are the three large bodies of standing water that have formed as a result of the mineral extraction. A

gravel berm has been constructed between the lakes and the river. However, both wind and water erosion has caused the grade separation to decrease to approximately two feet in the north area of Lake 3. An exceptionally high water flow could cause a breakdown resulting in the merging of Lake 3 and the river. This berm should be reconstructed and stabilized to prevent this potential problem.

Supplementary Information

The following tables present a compilation of information concerning the characteristics and capabilities of the soils present in South Platte Park. Although specific site analysis should take place prior to revegetation programs or development, the information presented typifies a floodplain with a fairly unstable soil system and limited capability for revegetation.

Table 1
LIMITATIONS OF SOILS

SOIL TYPE	MANAGEMENT CONSIDERATION	VEGETATION SELECTION	RECOMMENDED USES	RECREATIONAL AREAS	BUILDING FOUNDATION
Edgewater Series	High Water Table	Severely Reduced	Permanent Grass	Slight	Moderate
Gravelly	Erosion due to Water and Wind	Protective Ground Cover	Pasture/Range Wildlife	Slight	Slight
Heldt Clay	High Run-off due to Hard Clay Surface	Very Severely Reduced	Pasture	Moderate	Severe
Nunn	Wind Erosion Where Ground Cover is Lacking	Reduced	Pasture	Slight	Moderate
Terrace	Erosion due to Water and Wind	Protective Ground Cover	Pasture/Range Woodland Wildlife	Severe	Severe
Wet	Subject to Flooding	Riparian Best Choice	Pasture/Range Woodland Wildlife	Slight	Severe

U.S. Department of Agriculture, Soil Conservation Service. 1971.

Table 2
CAPABILITY OF SOILS TO SUPPORT VEGETATION

PLANT TYPE	HELDT (H1B)	NUNN LOAM (N1B)	EDGEWATER (EdB)	WET ALLUVIAL (Wt)
Shrubs	Poor to fair	Fair to good	Fair to good	Fair to good
Evergreens	Fair	Good	Fair to good	Fair to good
Broad Leafed	Poor to fair	Fair	Poor to good	Poor to good
Riparian Vegetation	Poor to fair	Poor to fair	Excellent	Excellent

U.S. Department of Agriculture, Soil Conservation Service. 1971.

Table 3
SPECIES RECOMMENDATIONS FOR SPECIFIC SOILS

EdB	Tall and Intermediate Wheatgrass, Tall Fescue, Reed Canary Grass, Green Ash, Chokecherry, Colorado Blue Spruce, Willow, Cottonwoods
Wt	Tall and Intermediate Wheatgrass, Tall Fescue, Reed Canary Grass, Green Ash, Chokecherry, Colorado Blue Spruce, Willow, Cottonwoods
H1b	Russian Wildrye, Wheatgrasses
N1B	Russian Wildrye, Wheatgrasses, Smooth Brome, Sweet Clover

U.S. Department of Agriculture, Soil Conservation Service. 1971.

Table 4
ESTIMATED ENGINEERING PROPERTIES OF SOIL

SOIL TYPE	PERMEABILITY RATE inches/hour	AVAILABLE WATER HOLDING CAPACITY inches/in of soil	REACTION pH	SHRINK-SWELL POTENTIAL
EdB	0.63	0.18-0.20	6.5-7.5	Low to Moderate
Gr	0.63-6.3	0.08	6.6-8.4	Low
H1B	0.63	0.25	7.0-9.5	High
Tc	Information not available			
Wt	0.63-6.3	0.08-0.15	6.5-7.5	Low
N1B	0.63-6.3	0.20	7.5-8.5	Moderate

U.S. Department of Agriculture, Soil Conservation Service. 1971

Capability to Support Visitor Use

Management practices should make a point of minimizing soil compaction and erosion due to visitor use. Areas that will need special management consideration are the east bank of the river where extreme erosion is evident and the revegetating area on the west side where gravel extraction has taken place.

A network of designated trails will help in directing the use flow through the park and protect the majority of the resource from high impact. An interpretive program incorporating man's relationship to soils and his impacts on them and the vegetation it supports would also help in reducing impacts.



Figure 3: MAP OF SOILS

Vegetation

AREA STUDIED

A vegetation analysis and map of South Platte Park was completed in the summer of 1982. The study area included all land within the current park boundaries, excluding the Cooley property acquired in December, 1982. A species list appears in Appendix II.

EXISTING DATA

A floristic inventory and analysis of the vegetation was conducted in the fall of 1974 and included in the conceptual master plan.

Species collections were pressed, dried and identified. The specimens were then checked with the Herbarium at Colorado State University, Fort Collins. In addition to a complete species list, the report contained a brief discussion on disturbance and flooding.

ON-SITE INVENTORY

The vegetation was classified into the following six associations:

1. Mature wooded
2. Intermediate age wooded/shrub
3. Seedling aspen/willow
4. Grassland
5. Marshland
6. Arid plants

Field observations were compared with the conceptual plan species list and aerial photographs. A vegetation map (Figure 4) was compiled as a result of this study.

DISCUSSION

South Platte Park is classified as a riparian site for the vegetation typical of streamsid es and moist depressions. One of the common riparian species is the plains cottonwood (Populus sargentii), which follows the Platte River into eastern Nebraska.

Natural succession is the orderly and progressive replacement of one plant community by another until a relatively stable community, often called the climax, occupies the area. Within South Platte Park, the vegetation is moving from a grass to shrub to natural riparian woodland common to a floodplain. This process is occurring in the southerly, southeasterly and northeasterly sections of the park. Quaking aspen (Populus tremuloides), which grow along the lake shores and river banks is a very aggressive pioneer species in the course of succession.

Mature plains cottonwood groves exist at the extreme northeastern and southeastern sections of the park. Along with a few boxelder (Acer negundo), they make up the climax species and are self-maintaining, self-reproducing and relatively permanent. Other associates are the lanceleaf cottonwood (Populus acuminata) and narrowleaf cottonwood (Populus angustifolia).

Shrubs and vines common to plains cottonwood stands are peachleaf willow (Salix amygdaloides), wild grape (Vitis vulpina), poison ivy (Toxicodendron radicans), and common chokecherry (Prunus virginiana).

A unique situation exists along the east and west sides of the river in the central portion of the park where the arid plants, fringed sage (Artemisia frigida), prickly pear (Opuntia phaeacantha) and blue yucca (Yucca baccata) grow adjacent to the succeeding riparian woodland.

West of the old Englewood pump station there is an excellent example of natural reclamation and succession. Willows (Salix sp.) and various legumes are slowly progressing naturally into the former river bottom. Lichens and mosses also evidence this revegetation process. This area should be allowed to progress naturally and will serve as a valuable environmental education tool.

The southwest portion of the park is severely lacking in ground cover. Completed reclamation included drill-seeded grass mixtures and sweet clover which has been successful in some areas. However, wind, water and visitor caused erosion has left many areas barren and in need of an aggressive pioneer species.

RECOMMENDATIONS

Soil Stabilization

Rapid stream bank erosion is occurring along the southeast banks of the Platte River. The near vertical banks consist of a clayey to

sandy material that continually sloughs off with river fluctuations. Because of this factor, tree seedlings will not have a chance to become established. An attempt to cultivate native grass species is recommended. A trail system should not be developed near the eroding areas for reasons of visitor safety and preventing further sloughing. Aggressive, high nutrient, high duff species should be planted between the lakes to encourage stabilization of the barren areas.

Aesthetic Enhancement

Plantings along the park borders and trail systems are recommended for visual and physical barriers. The species selected should be typical of a riparian woodland, and arranged in a natural pattern. Grouping and irregular planting patterns should typify the enhancement program to encourage mixed-age stands and natural propagation. An inexpensive method of propagation would be the use of stem cuttings from the trees already established in the area.

A nursery within the park, managed under the supervision of Colorado State University, would be a possible source for the plantings and present an excellent opportunity for graduate level study.

Wildlife Habitat Enhancement

See Habitat Enhancement Needs under WILDLIFE section.

Noxious Weed Control

Because of the disturbances occurring as a result of the gravel operations, many species of noxious weeds have invaded the park. The Canadian Thistle (*Cirsium arvense*) is the major concern for removal and it is widely spread throughout the park. The weed grows to a height of six feet and has very sharp spines. The seeds are wind-dispersed and cause a problem for adjacent landowners, particularly the Green Valley Turf Farm.

The removal plan for the 1982 season consisted of cutting the weeds off at the base. A schedule for "Roundup" herbicide application is recommended for the following spring when the weeds are about to flower and the stems are approximately one-half inch thick. An additional application of a pre-emergent, "Atrazine", to prevent seeds from germinating, might be considered after the "Roundup" application. The Arapahoe County Extension Office is interested in providing information concerning weed control and would like to be contacted prior to any

herbicide applications. Additional information and recommendations should be obtained from the weed control specialist at Colorado State University prior to implementation of a weed control program.

Impact of Visitor Use

Proper management techniques can be used to control and monitor the impact of visitors within the park. Photo files, surveys, and on-site observations are suggested as means of documentation. The staff can educate the public on park philosophies in order to minimize visitor impact.

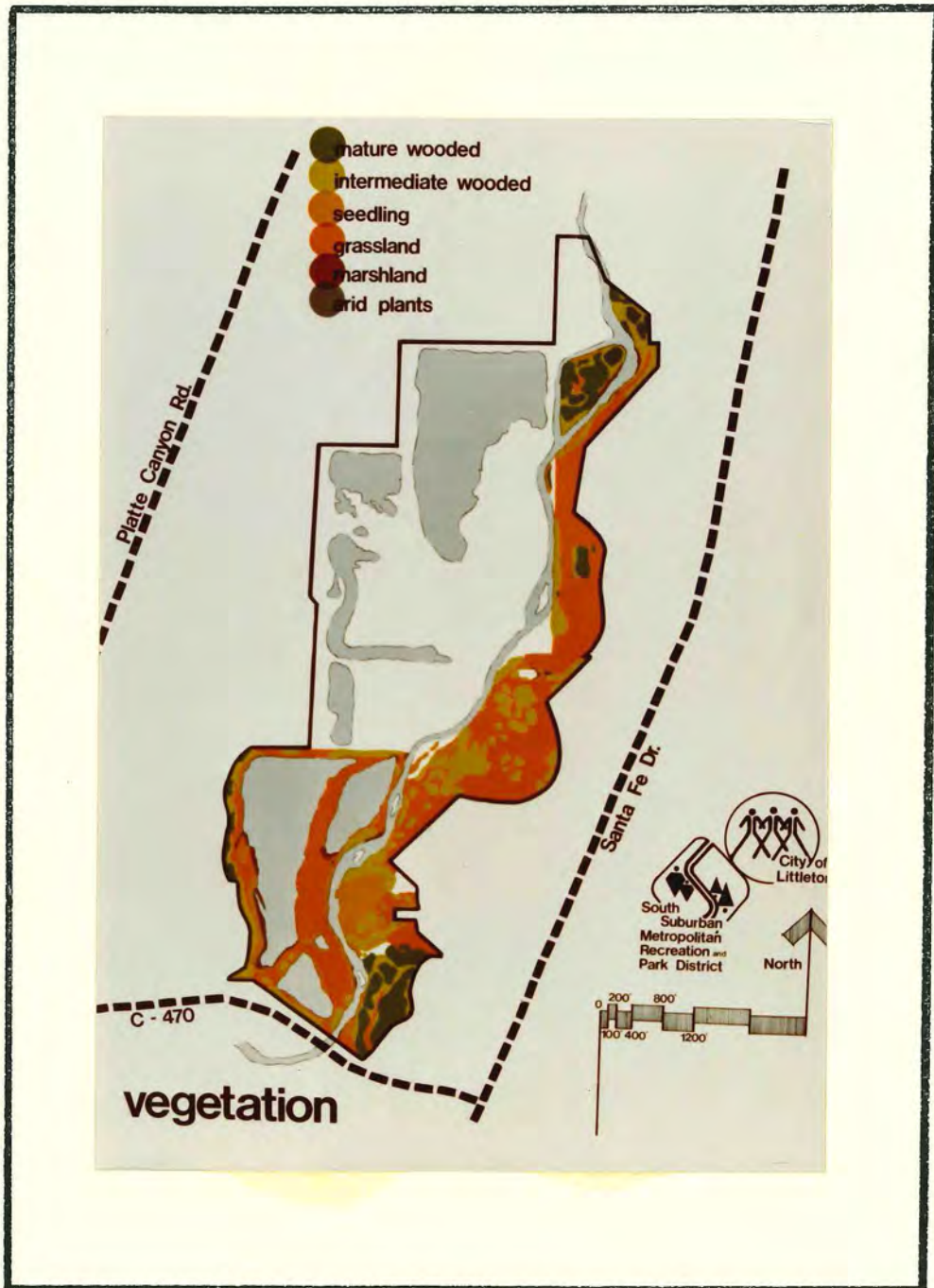


Figure 4: MAP OF VEGETATION

Wildlife

OBJECTIVE

The objective of this study is to collect new wildlife data for South Platte Park and to develop recommendations for wildlife management and habitat enhancement.

EXISTING DATA

During the spring of 1975, a team of wildlife consultants collected data for the South Platte Park area. The information was presented in the conceptual master plan of the Littleton Floodplain Park.

The study included on-site observations and inventories. An overview of species that were found in the park, possible wildlife that could be introduced, and a summary of recommendations for the park were then presented.

ON-SITE INVENTORY

Collection Procedures

Data for the 1982 season was collected during the months of July and August. The method consisted of staff observation and documentation of additional information provided by park visitors and adjacent landowners. The on-site data was obtained by walking all the land within the current park boundaries and documenting all sightings. Each sighting was recorded on a grid map (see Figure 5) and then transferred to a color-coded overlay. These overlays were used in conjunction with the vegetation map (Figure 4) to define significant habitat areas (Figure 6). See Appendix II for species list.

Field Observations

Tables 5 and 6 will provide a complete summary of all wildlife sightings in the South Platte Park area.

DISCUSSION

An evaluation of South Platte Park wildlife sightings indicates a diversity of species occurrence and the potential for an established

urban wildlife community. In accordance with the previously determined regional wildlife needs (C.D.O.W. 1977 Management Plan and the 1982 Draft, Management Plan), continued management strategies include: additional on-site inventories, species listing, behavioral observations and controlled species removal.

The South Platte Park area provides an excellent opportunity for bird watching, nature study and photography. Interpretive programming could be developed by studying or focusing on an individual species or deal with a larger community oriented theme.

There are many discrepancies between the conceptual master plan sightings and the current wildlife inventory. These differences are easily understood in light of the fact that the previous study was completed in 1975. During the past seven years, the surrounding gravel operations and other development may have had a significant impact on the resident wildlife population. As well, the previous study was completed during March as opposed to the current study which was conducted during the summer months. It is probable that some of the species observed during the spring stay in the area for breeding and rearing of the offspring and then leave the area. In addition, with varying migration routes, the avian species seen in the area may change from year to year. It is also important to note that wildlife populations fluctuate naturally as sources of food, water and shelter change.

HABITAT ENHANCEMENT

The Division of Wildlife has developed the final draft of the 1982 comprehensive management plan for Colorado's wildlife. The draft contains an overview of the Colorado habitat for wildlife, details about the wildlife resource, how people use the resource, and a list of goals for the next five years. The draft plan also includes a species list, the Division's objectives for the species list, and the management strategies to use in researching the objectives.

The following species were cited as requiring some form of habitat enhancement in this region. The priority and strategy is given for each.

Ring-Necked Pheasant, #1 priority: Improve pheasant habitat by increasing and improving nesting and winter cover. This can be achieved by young aspen and willow planting along the river bottoms and brush areas. For nesting requirements, grassy and weedy areas within the two miles of the above mentioned winter cover will be developed.

Ducks and Geese, #1 priority: Gain control over more habitat that is suitable for production. This can be achieved by developing islands and inlets along the lake shores. The lake bottoms should have a gentle slope to encourage the growth of marsh vegetation species.

Deer, #4 priority: Increase the carrying capacity of deer habitat through controlled fertilizing and timber management. This can be achieved by spreading dirt over the revegetative areas to encourage topsoil development. Legume species should be planted as a food source. Aspen and willow seedlings should be transplanted to eventually develop intermediate aged stands.

RECOMMENDED STUDIES

The Great Blue Heron population is currently leaving the Chatfield Dam area and possibly taking up residence within Platte Park. An intensive study should begin the spring of 1983 to document the birds' behavior. If nesting does occur, a specific management program would be required.

Wildlife activity cards are recommended for the documentation of observations, including data on species, age, sex, activity, time, date, and the location of the sighting. These cards should be filled out on a regular basis by all field personnel. The compilation of this data will yield important information concerning the fluctuation of populations, distinctions between resident and migratory species, and the habitat needs of each.

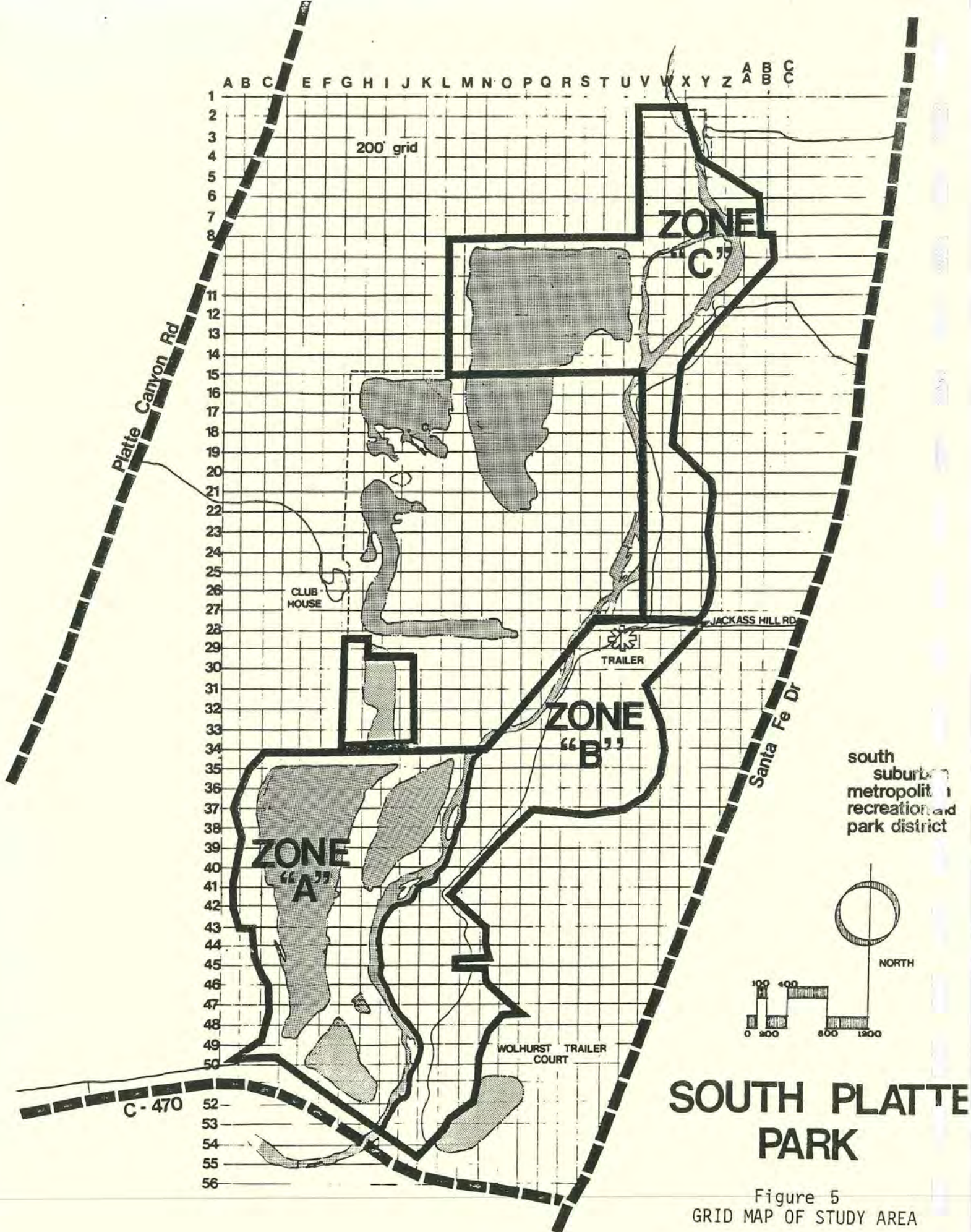


Figure 5
GRID MAP OF STUDY AREA

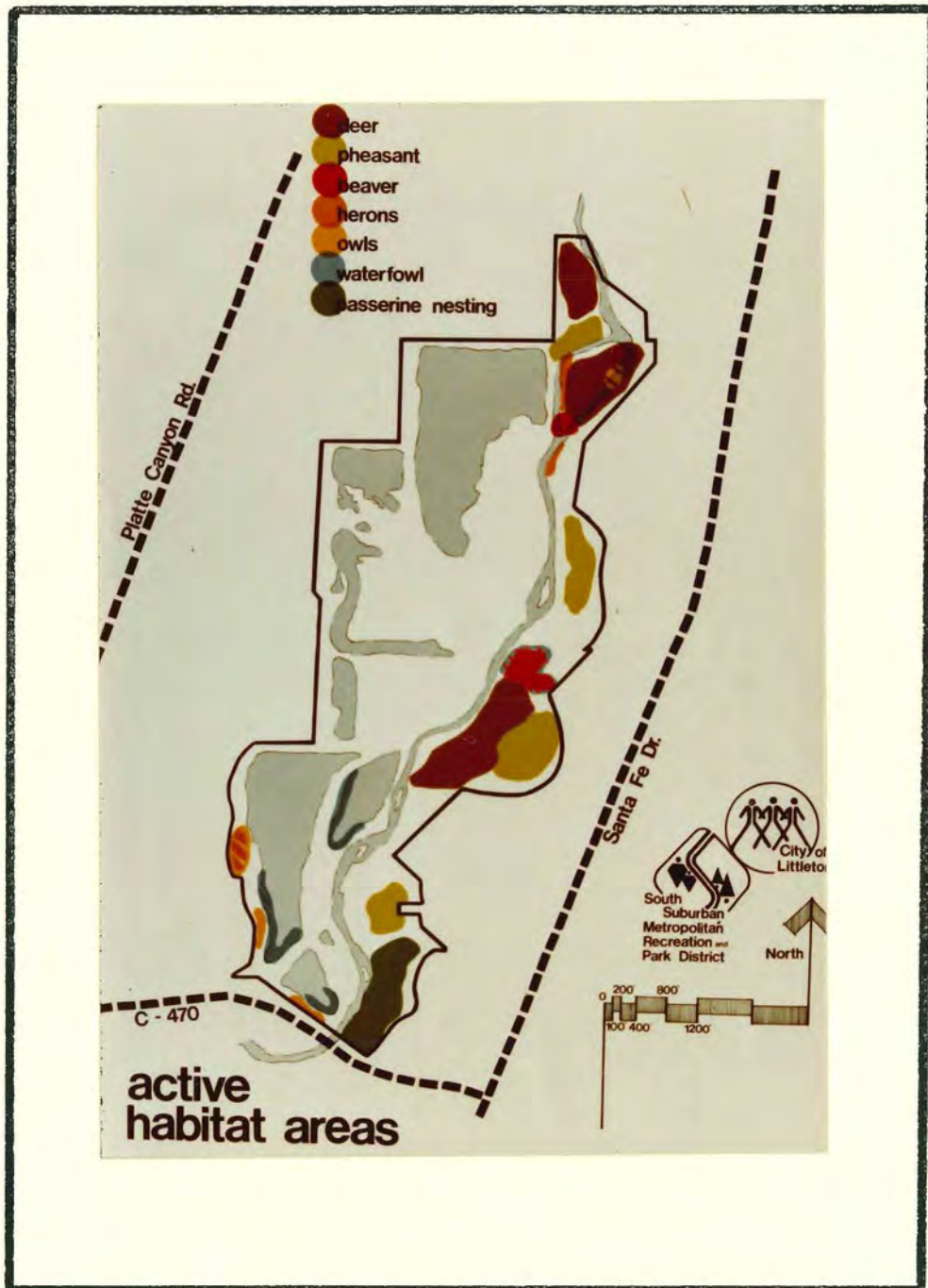


Figure 6: MAP OF SIGNIFICANT HABITAT AREAS

Table 5
WILDLIFE SIGHTINGS THROUGHOUT SOUTH PLATTE PARK
JULY/AUGUST, 1982

COMMON NAME	SCIENTIFIC NAME	NUMBER SIGHTED	SPECIFIC LOCATIONS
ZONE A			
Mule Deer	<i>Odocoileus hemionus</i>	2	C-470 area
Belted Kingfisher	<i>Megaceryle alcyon</i>	several	I-53
Rough Winged Swallow	<i>Stelgidopteryx ruficollis</i>	several	I-53
Great Blue Heron	<i>Ardea herodias</i>	2+	river
Great Horned Owl	<i>Bubo virginianus</i>	1	L-46
Red Tailed Hawk	<i>Buteo jamaicensis</i>	1+	-
Robin	<i>Turdus migratorius</i>	several	N-51
Starling	<i>Sturnus vulgaris</i>	numerous	-
Black Billed Magpie	<i>Pica pica</i>	numerous	-
Downy Woodpecker	<i>Dendrocopos pubescens</i>	several	-
ZONE B			
Mule Deer	<i>Odocoileus hemionus</i>	several	S-36/U-28
Raccoon	<i>Procyon lotor</i>	1	U-28/P-37
Ring-Necked Pheasant	<i>Phasianus colchicus</i>	several	K-44
Great Blue Heron	<i>Ardea herodias</i>	several	I-44/L-38
Common Night Hawk	<i>Chordeiles minor</i>	several	-
Red Shafted Flicker	<i>Colaptes cafer</i>	several	-
Western Kingbird	<i>Tyrannus verticalis</i>	several	-
Downy Woodpecker	<i>Dendrocopos pubescens</i>	several	-
Red Winged Blackbird	<i>Agelaius phoeniceus</i>	numerous	-
Black Billed Magpie	<i>Pica pica</i>	numerous	-
ZONE C			
Mule Deer	<i>Odocoileus hemionus</i>	several	Y-10
Coyote	<i>Canas latrans</i>	several	-
Red Fox	<i>Vulpes fulva</i>	several	-
Red Tailed Hawk	<i>Buteo jamaicensis</i>	several	-
Mallard	<i>Anas platyrhynchos</i>	numerous	-
Great Blue Heron	<i>Ardea herodias</i>	several	V-13/V-25
Ring Billed Gull	<i>Larus delawarensis</i>	numerous	V-13/V-25
Robin	<i>Turdus migratorius</i>	several	-
Western Kingbird	<i>Tyrannus verticalis</i>	several	-
Black Billed Magpie	<i>Pica pica</i>	numerous	-
Starling	<i>Sturnus vulgaris</i>	numerous	-
Great Horned Owl	<i>Bubo virginianus</i>	2+	V-16/W-13
Cottontail Rabbit	<i>Sylvilagus floridanus</i>	numerous	-
Bull Snake	<i>Pituophis melanoleucus</i>	several	-

South Suburban Metropolitan Recreation and Park District

Table 6
WILDLIFE SIGHTINGS, LAKES 1-4,
SOUTH PLATTE PARK, JULY/AUGUST, 1982

COMMON NAME	SCIENTIFIC NAME	NUMBER SIGHTED	SPECIFIC LOCATIONS
LAKE 1			
Red Winged Blackbird	<i>Agelaius phoeniceus</i>	numerous	-
Black Billed Magpie	<i>Pica pica</i>	numerous	-
Mourning Dove	<i>Zenaidura macroura</i>	numerous	-
Mallard	<i>Anas platyrhynchos</i>	numerous	-
Beaver	<i>Castor canadensis</i>	2+	G-49
Muskrat	<i>Ondatra zibethicus</i>	2+	-
Bullfrog	<i>Rana catesbiana</i>	numerous	-
Gray Squirrel	<i>Sciurus carolinensis</i>	numerous	-
Cottontail Rabbit	<i>Sylvilagus floridanus</i>	numerous	-
Garter Snake	<i>Thamnophis sirtalis</i>	numerous	-
Six-Lined Lizard	<i>Cnemidophorus sexlineatus</i>	numerous	-
LAKE 2			
Red Tailed Hawk	<i>Buteo jamaicensis</i>	1	B-43
Great Horned Owl	<i>Bubo virginianus</i>	2	B-40
Great Blue Heron	<i>Ardea herodias</i>	5+	B-40
Canadian Geese	<i>Branta canadensis</i>	100+	-
Mallard	<i>Anas platyrhynchos</i>	numerous	-
Muskrat	<i>Ondatra zibethicus</i>	several	D-40
Cottontail Rabbit	<i>Sylvilagus floridanus</i>	numerous	-
Red Winged Blackbird	<i>Agelaius phoeniceus</i>	numerous	-
Black Billed Magpie	<i>Pica pica</i>	numerous	-
Starling	<i>Sturnus vulgaris</i>	numerous	-
Bull Snake	<i>Pituophis melanoleucus</i>	several	-
Garter Snake	<i>Thamnophis sirtalis</i>	several	-
LAKE 3			
Beaver	<i>Castor canadensis</i>	1	-
Bull Snake	<i>Pituophis melanoleucus</i>	numerous	-
Garter Snake	<i>Thamnophis sirtalis</i>	numerous	-
LAKE 4			
Beaver	<i>Castor canadensis</i>	1	-
Mourning Dove	<i>Zenaidura macroura</i>	numerous	-
Western Meadowlark	<i>Sturnella neglecta</i>	numerous	-

South Suburban Metropolitan Recreation and Park District

Aquatic Resources

INTRODUCTION

The purpose of the combined sections of hydrology, water quality, and fisheries biology is to obtain an integrated resource evaluation for the development of an effective and practical management plan. Although each discipline can be addressed separately, the degree of importance that each area will play in the overall management is more clearly seen in this perspective.

The existing and current site inventories have been used to supplement recommendations for habitat enhancement. Alternative plans were developed for a more effective habitat enhancement program which will provide the needed fisheries production for the area.

Prior to the actual construction of the new recreation resource, existing management philosophies will be evaluated depending upon the resource and recreational needs of the region and the community. As the habitat enhancement and stocking programs become a reality, the fisheries regulations will also be evaluated as to short-term and long-term impact upon the area.

As indicated in earlier sections, these recommendations reflect the independent assessment of resource needs and will serve as a management recommendation only. In the event that additional needs become apparent, further evaluations and recommendations will be made at that time.

STUDY AREA

Refer to Figure 1 for a complete graphical representation of the South Platte Park study area.

HYDROLOGY

The required hydrological evaluations have previously been conducted by the Army Corps of Engineers, the responsible agency for the overall floodplain management of the South Platte River. Existing data and updated information can be reviewed by consulting the reference section of previous reports. With the exception of the habitat enhancement program, all hydrological studies, problems, documentation, and decision making will be handled by the Army Corps of Engineers, Omaha, Nebraska District Office. South Suburban Metropolitan

Recreation and Park District will serve as an on-site liaison between the Army Corps of Engineers and the resource.

Further evaluations should be conducted to measure the impact of the proposed river channelization near Bowles Avenue north of the park boundary. Since the Army Corps of Engineers will complete the design and construction of the project, the only involvement of South Suburban Metropolitan Recreation and Park District will be with the legal access and roadway considerations that are planned for the adjacent park areas.

Additional flow regime alterations will result from the proposed Trout Unlimited habitat enhancement programs which will include the area from the Cooley Gravel Company bridge to the southern boundary of the park. Any information on this stretch will be directed by the District to the local Trout Unlimited Chapter (see Appendix II).

WATER QUALITY

River

The existing water quality field data includes a limited program of measurements collected through the Colorado Department of Health for the South Platte River and a more extensive sampling program through the Army Corps of Engineers for the Chatfield Reservoir area (commencing during the summer of 1982). An evaluation of the Department of Health and the Army Corps of Engineers data indicates that the in-flowing water through the park could be considered of good quality without any heavy metal or related pollutant levels of concern. During the Water Quality Control Commission hearings, this portion of the river running through the park was classified "cold-water Class I", the highest rating possible in terms of aquatic biota and recreational uses. However, the sewage easements in the park vicinity could provide a potentially detrimental influence in terms of increased bacterial or viral pathogen populations. An additional program recently implemented by the City of Littleton through the U.S. Geological Survey will document South Platte River conditions above, immediately below, and further downstream of the Mission Viejo sewage diversion project (upstream of the park). A future review of all agency data will provide a more complete evaluation of this aspect of the resource.

Lakes

Due to the runoff, groundwater in-flow, and river influences, the water quality of the lakes will be constantly changing. In general, each of the lakes can be considered to be in a fairly healthy, yet unproductive state due to the absence of fisheries habitat and corresponding aquatic vegetation. However, other considerations could determine the overall suitability of the resources for further recreational development (water contact activities).

As a result of the nature of the floodplain lakes, the possibility exists for a substantial in-flow of pollutants. While these conditions are not documented at this time, correlations between river and lake water quality may exist. This relationship could, in turn, influence future decisions concerning public use of the lake and river areas. The situation further justifies the need to continue an adequate sampling program for the river, both for present management decisions and long-term water quality trend information. It is recommended that additional sampling sites include the lakes, the Olsen property, the area north of Lake 2, and the areas that are presently being mined. Additional program recommendations will be obtained through the previously mentioned agencies.

Preliminary limnology and water quality data will be found in Tables 7 and 8, and Figure 7.

Table 7
LIMNOLOGY, WATER QUALITY DATA (LAKES IN STUDY AREA)

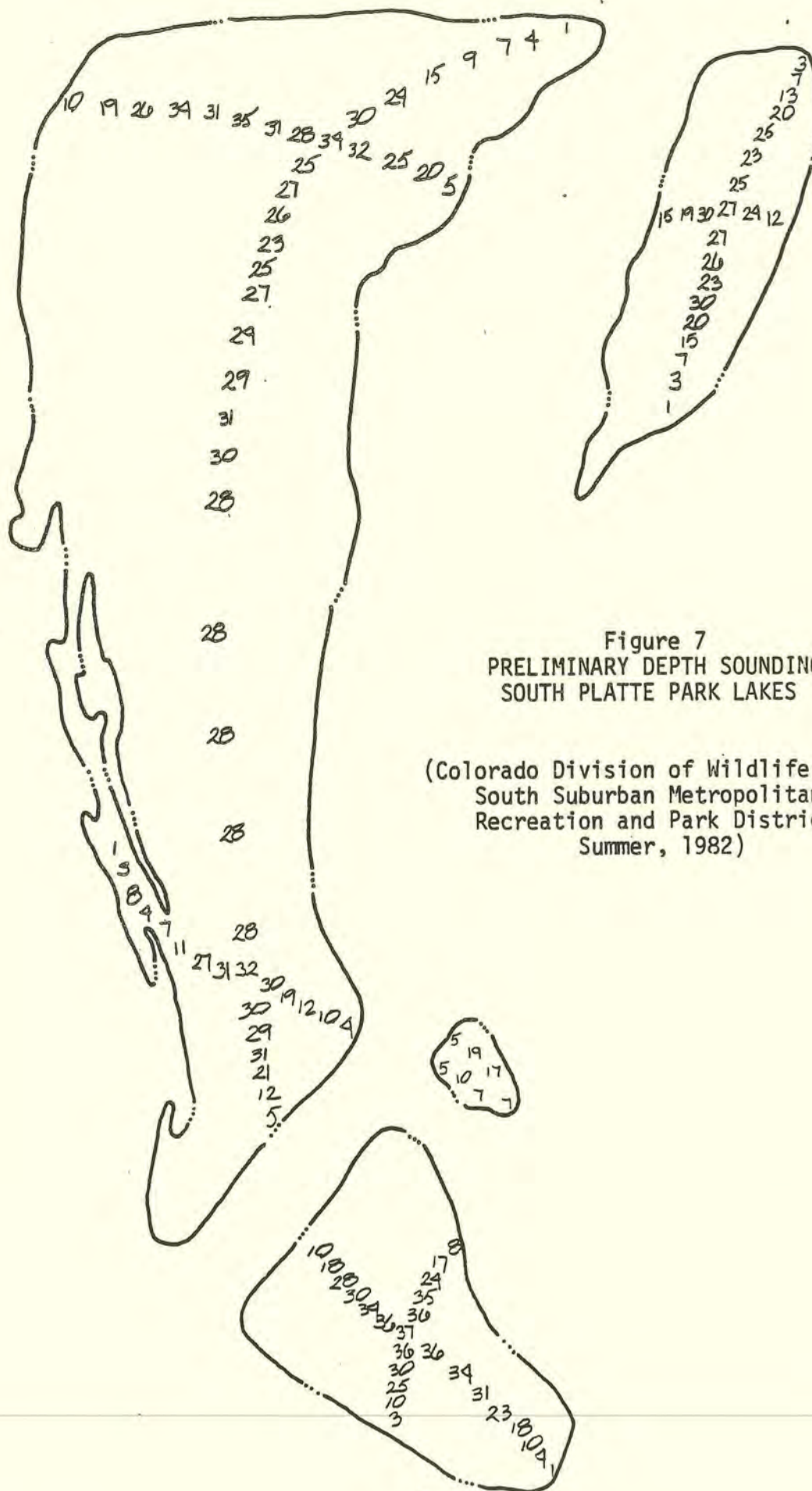
LAKE 1 9-21-82	Depth (m)	surface		2		4		6	
	Temp. (°C)	20		17		17		17	
	Dissolved Oxygen (D.O.ppm)	8.5		8.3		8		7.8	
LAKE 2 7-12-82	Depth (m)	surface	1	2	3	4	5	6	7
	Temp. (°C)	23	22	21.5	21.5	21	21	19	19
	Dissolved Oxygen (D.O.ppm)	6.6	6.6	6.6	6.8	6.9	6.9	7.5	7.6
LAKE 3 9-21-82	Depth (m)	surface		2		4		6	
	Temp. (°C)	18		18		17		17	
	Dissolved Oxygen (D.O.ppm)	15		8		7.9		7.5	
LAKE 4 9-21-82	Depth (m)	surface		2		4			
	Temp. (°C)	21		19		18			
	Dissolved Oxygen (D.O.ppm)	15		8.5		8.3			

Colorado Division of Wildlife July, 1982, and September, 1982.

Table 8
WATER RESOURCE DATA (LAKES IN STUDY AREA)

AREA (sample date)	ESTIMATED AGE (years)	ESTIMATED SURFACE AREA (acres)	VISIBILITY Secchi Disc (m)	pH	HARDNESS (mg/l CaCO ₃)	ALKALINITY (mg/l CaCO ₃)	CONDUCTIVITY (mmhos/cm ² at °C)
(7-12-82) LAKE 1 (9-21-82)	4	7.3	-	8.2	205	120	440 @ 20°C
LAKE 2 (7-12-82)	3	42.2	2.4	8.5	274	154	560 @ 22.5°C
(7-12-82) LAKE 3 (9-21-82)	3	13.1	2.7	8.3	257	154	460 @ 18°C
(7-12-82) LAKE 4 (9-21-82)	4	0.4	2.6	8.5	222	120	380 @ 21°C
WATER BOARD LAKE	3	6.4	-	-	-	-	-
OLSEN LAKE	8	62.1	-	-	-	-	-

Colorado Division of Wildlife July, 1982, and September, 1982



Fisheries Biology

INTRODUCTION

The combined effects of increased quality of fishing and ease of access to prime areas could eventually limit the productivity of the aquatic system. In order to effectively manage the resource to provide a "quality" fishing experience for all park visitors, a logical inventory, assessment, recommendation, and re-evaluation program must be followed.

Initial surveys and resource evaluations for these areas have been utilized to effectively determine preliminary habitat enhancement programs. The construction and installation of these structures are scheduled for construction in early 1983, with additional recommendations to be made accordingly.

As further resource inventory information continues to become available, finalized stocking recommendations will be made in conjunction with the Colorado Division of Wildlife. These suggestions will address all biological resource management concerns, species availability, stocking logistics, and cost considerations. Subsequent regulation specifics will be evaluated for "Interim Status Designation" and finalized designations prior to the actual stocking.

EXISTING DATA

Previous studies of the area lakes include limited Division of Wildlife electrofishing surveys of the South Platte River. Minimal overview data was also collected in 1975 and was used to determine a conceptual master plan for resource development. At that time, recommendations included a "put and take" fishery without habitat enhancement. These recommendations, in conjunction with standard stocking programs, may result in a fairly unproductive fishery and a corresponding limited fishing opportunity for the community. Table 9 will list the species collected during the limited 1975 electrofishing surveys.

Table 9
SPECIES OCCURRENCE AND RELATIVE ABUNDANCE OF FISH
IN SOUTH PLATTE RIVER AND LAKES
IN SOUTH PLATTE PARK

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE
	RIVER	
Western White Sucker	Catostomus commersoni	common
Longnose Sucker	Catostomus catostomus	common
Fathead Minnow	Pimephales promelas	common
Creek Chub	Semotilus atromaculatus	common
Sand Shiner	Notropis stramineus	common
Black Bullhead	Ictalurus melas	occasional
Longnose Dace	Rhinichthys cataractae	occasional
Green Sunfish	Lepomis cyanellus	occasional
Largemouth Bass	Micropterus salmoides	infrequent
Channel Catfish	Ictalurus punctatus	infrequent
Smallmouth Bass	Micropterus dolomieu	rare
Yellow Perch	Perca flavescens	rare
Common Shiner	Notropis cornutus	rare
Brown Trout	Salmo trutta	rare
Common Carp	Cyprinus carpio	rare

	LAKES	
Western White Sucker	Catostomus commersoni	common
Fathead Minnow	Pimephales promelas	common
Creek Chub	Semotilus atromaculatus	common
Black Bullhead	Ictalurus melas	occasional
Green Sunfish	Lepomis cyanellus	occasional
Largemouth Bass	Micropterus salmoides	infrequent
Yellow Perch	Perca flavescens	rare
Common Carp	Cyprinus carpio	rare
Rainbow Trout	Salmo gairdneri	rare
Bluegill	Lepomis macrochirus	rare
Black Crappie	Pomoxis nigromaculatus	rare
Pumpkinseed	Lepomis gibbosus	rare

Hagen Fisheries, Consultants, 1975.

ON-SITE INVENTORY

PRE-CONSTRUCTION DESCRIPTIONS

Aquatic Ecology: River

Preliminary observations of the river habitat indicate conditions that are fairly unproductive due to the periodic scouring from flow regulations. An absence of adequate riffles, banks, rapids, and pools contributes to the sparse biotic conditions and subsequent lack of lower food chain organisms.

Aquatic Ecology: Lakes

An on-site evaluation of the lake aquatic ecology characteristics indicates that all of the floodplain lakes are in a semi-productive state with a fairly unbalanced food chain. Lack of adequate cover, forage, and shallow areas will prevent further resource diversity unless sufficient substrate materials are provided for organism colonization.

Species Inventory: River

Presently, only limited fisheries data is available for this particular stretch of the South Platte River. The electrofishing surveys can be conducted during the spring of 1984 to document post-habitat enhancement construction conditions. Current creel survey estimates of species occurrence include Rainbow Trout (Salmo gairdneri) and Brown Trout (Salmo trutta) released from Chatfield Reservoir and occasional Channel Catfish (Ictalurus punctatus).

Species Inventory: Lakes

Fisheries investigations were undertaken during the summer and fall of 1982 to document existing species occurrence and distribution in the South Platte Park floodplain lakes (See Table 10). The objectives of the program were: 1. To obtain a representative description of the resident fish populations; 2. To utilize the information in recommending area stocking programs.

A partial evaluation of available creel survey information indicated that most fishermen were experiencing catches of small (6"-8") Yellow Perch (Perca flavescens), small (6"-8") Black Crappie (Pomoxis nigromaculatus), occasional medium sized (10"-12") Largemouth Bass (Micropterus salmoides), and a record (19 lb., 31") Channel Catfish (Ictalurus punctatus).

Table 10
ELECTROFISHING SURVEY DATA
LAKES IN STUDY AREA

SPECIES (COMMON NAME)	TOTAL NUMBER COLLECTED	MEAN LENGTH (mm)	LENGTH RANGE (mm)	MEAN WEIGHT (gm)	WEIGHT RANGE (gm)	% TOTAL CATCH
LAKE 1						
Yellow Perch	18	160	145-174	51	36-64	78.3
Black Crappie	3	135	133-137	33	29-38	13.0
Green Sunfish	2	88	87-89	14	10-18	8.7
LAKE 2						
Western White Sucker	21	278	170-357	226	47-420	33.3
Green Sunfish	16	97	75-146	19	10-40	25.4
Yellow Perch	7	116	93-142	12	10-22	11.1
Black Bullhead	6	179	165-213	100	82-167	9.5
Black Crappie	5	171	155-196	62	49-93	7.9
Sand Shiner	3	75	-	-	-	4.8
Fathead Minnow	3	75	-	-	-	4.8
Largemouth Bass	2	340	337-343	556	554-578	3.2
LAKE 3						
Western White Sucker	9	149	120-240	39	16-128	69.2
Green Sunfish	3	112	110-115	24	22-28	23.1
Black Bullhead	1	130	130	30	30	7.7
LAKE 4						
Yellow Perch	1	122	122	26	36	50.0
Black Bullhead	1	55	55	-	0	50.0

Colorado Division of Wildlife. September, 1982.

An electrofishing survey conducted during July 1982 indicated similar findings with the inclusion of numerous medium sized (10"-15") Western White Suckers (Catostomus commersoni), small (1"-3") Bluegill Sunfish (Lepomis macrochirus), small (1"-3") Green Sunfish (Lepomis cyannellus) and occasional small (1"-5") Black Bullheads (Ictalurus melas). Also noted was an abundance of large (5"-7") undeveloped Salamanders (Order Caudata) which could indicate an absence of adequate predator species. An additional electrofishing survey conducted during September of 1982 did not obtain representative data possibly due to (1) fish behavior of staying in the deeper, unshockable waters during the colder part of the season and (2) decreased water conductivity which would limit the size of the electrical field.

Due to the topography of the lakes, a more representative idea of the populations could be obtained by additional netting methods and ultimately through direct observation by scuba diving.

HABITAT ENHANCEMENT PROGRAMS

DESCRIPTIONS OF RECOMMENDED PROGRAMS

As the following habitat enhancement programs are implemented, the conditions as described above should change. The projects will increase the available substrates, species niches, and subsequently supply the needed habitat areas for additional benthic macroinvertebrate (aquatic insect), periphyton (attached microscopic plants), phytoplankton (free-floating microscopic plants), zooplankton (free-floating microscopic animals), and various species of aquatic vascular plants.

River

The habitat enhancement programs as recommended by the Cutthroat Chapter of Trout Unlimited will consist of a series of riffle, rip rap, random boulder placement, and other methods designed to effectively increase the coldwater fishery potential of the area. Volunteer members of sportsmen's special interest groups, social and service organizations, and community citizens will all contribute to this cooperative effort. (See Appendix II.)

Lakes

The recommended habitat enhancement programs for the lake areas include artificial reef construction and possible spawning area enhancement programs. The design and placement of the artificial reefs will be

handled by the Division of Wildlife, with the technical assistance of the Bass Anglers Sportsmen's Society local chapter--Denver Bassmasters, Inc. Suggested materials include pine trees, tree branches, or tires. Spawning area enhancement programs should be considered in the reclamation of the areas presently being mined.

Further recommendations include the enhancement of several areas on the east side of the river, downstream of the Colorado 470 bridge. The area has an existing sewage culvert transgressing the river which has historically diverted the river flow away from the already eroded bank areas of the east side of the river. The removal of this culvert will inevitably cause additional erosion to occur. The simultaneous removal of the culvert sections along with the subsequent replacement of rip rap will ensure bank protection and additional fisheries habitat.

An additional consideration in the recommended management plan includes the restoration of food source organisms in the river and lake areas. Suggested species include various aquatic insects, crayfish, and minnows. With a rejuvenated food chain, the resource should eventually become balanced at all trophic levels.

PRELIMINARY STOCKING RECOMMENDATIONS

As additional Division of Wildlife electrofishing survey information becomes available during the spring and summer of 1983, more conclusive recommendations will be made. Suggested stocked species could include catchable sized (4"-6") Rainbow Trout as a reasonable addition to the fishery.

As indicated in the previous discussion, further stocking recommendations will be made as additional survey information becomes available. Suggested stocking programs could include Largemouth Bass as the primary predator species and possibly a small number of Muskellunge (Esox masquinongy) to eliminate the Western White Sucker populations. Additional stocking recommendations should include the standard Channel Catfish/Green Sunfish complex.

The availability of species will play a large part in the overall viability of the stocking program. The stocking costs of Largemouth Bass (\$1.50 per 6" fish) could limit the stocking numbers. An alternate program such as the Division of Wildlife's pioneer bass salvage program could provide the needed fish, but only on an intermittent schedule. As adult species are collected from underutilized areas and

placed in more appropriate resources, the program could significantly contribute to a trophy sized management program.

As part of the Metro Fishing Program, specialists have cited a need for more diversity in the fishing opportunities available. Specifically, natural, quality fisheries are lacking in the Denver metropolitan area and South Platte Park has been recognized as having the potential to meet some of that need. One possibility would be to develop a variety of experiences such as trophy bass fishing in Lake 2 and panfishing in Lake 1. This type of program could help to meet the regional needs as well as widen the scope of opportunities in the park.

POTENTIAL IMPACTS: RIVER

Construction Impacts

During the construction phases of the habitat program and park facilities (bridges), impacts are maximized due to the sensitive conditions (low flow) of the fall/winter construction periods. The actual changes will include increased suspended solids, turbidity, oil and grease, and corresponding temporary decreases in dissolved oxygen levels. Depending upon the project design, the irregular release schedules and varied amounts of released water (up to 5,000 cfs) could affect the new flow conditions of the river with respect to increased river bed scouring, resulting in the conditions described above.

Mitigation Measures

The recommended mitigation measures to minimize construction impacts would include the utilization of coffer dams, rip rap support of turbidity barriers, temporary river re-routing, and river flow regulation by the Army Corps of Engineers. Cofferd dam de-watering for bridge construction would include the removal and placement of water into de-watering/settling basins or downstream areas. Miscellaneous spillages could be prevented by the use of turbidity barriers to contain the materials. River flow regulation will probably be the most effective method in terms of construction ease, logistics, and cost.

POTENTIAL IMPACTS: LAKES

Construction Impacts

Due to the nature of the recommended habitat enhancement programs, there will not be any anticipated construction impacts to the lake areas. The artificial reefs as designed by the Colorado Division of Wildlife will not affect the resource since installation does not require the use of any potentially impacting procedures or heavy construction equipment.

Mitigation Measures

The recommended mitigation measures for the installation of the artificial reefs will include the basic practices commonly used in projects of this nature.

DEMAND

Current Visitor Use Patterns

The purpose of obtaining visitor use statistics during the past summer was to monitor and document use patterns rather than to determine a total visitor count.

METHODS

Since no formal access area was established, entrance to the park was varied and difficult to monitor accurately. However, the majority of the visitors entered from Colorado 470 and parked in that vicinity. Therefore, the count concentrated on use around the four southern lakes and the upper river. The number of vehicles parked on each end of the Colorado 470 entrance was also noted. Use periods were broken down into three timeframes: morning (8 a.m. to 12 noon), afternoon (12 noon to 6 p.m.), and evening (6 p.m. to 10 p.m.). Some visitors and their vehicles may have been counted more than once if their stay overlapped these periods. As well, short term visitors and river users may have been missed between counts. The data collected therefore represents only visitor use patterns and is not a total visitor count. Table 11 will summarize all information that was obtained during the monitored periods. Figures 8 and 9 outline the primary areas of use.

DISCUSSION

The data shows a fairly typical use pattern of high weekend afternoon visitation. Specifically, Sunday afternoons were the busiest periods, with significant increases in visitation noted on the days that Chatfield Recreation Area closed early in the day due to capacity crowds. The heaviest weekday visitation was in the late afternoon and evening which typifies the expected use at an area where fishing is the primary activity.

Lake 2 was the most heavily used area during the week while weekend visitors tended to use the river area. Many river recreationists were water-contact oriented and significant changes in use patterns should be anticipated if swimming areas are opened on any of the lakes. The low use of Lake 3 was most likely due to the fact that the lake is not visible from the entrance and most visitors remained unaware of it.

Maximum use occurred during the month of July. This may be due to the rainy weather typical of August in contrast to the hot afternoons of late July. It should be noted that no public announcement

Table 11
VISITOR USE PATTERNS
SUMMER, 1982

USE CATEGORY/TIME OF DAY	MONTH, 1982		
	JULY	AUGUST	SEPTEMBER
<u>Average Weekday Use</u>			
Morning	6	3	*
Afternoon	9	13	*
Evening	10	3	*
<u>Average Weekend Use</u>			
Morning	14	9	*
Afternoon	57	26	13
Evening	23	7	7
<u>Average Total Week Use</u>			
Morning	13	7	*
Afternoon	29	14	*
Evening	14	5	*
<u>Maximum Number of Park Visitors</u>			
Morning	37	29	*
Afternoon	183	77	35
Evening	32	15	19
<u>Maximum Number of Vehicles</u>			
Morning	12	10	*
Afternoon	95	45	29
Evening	16	14	9
*Indicates insufficient data			

South Suburban Metropolitan Recreation and Park District

Figure 8
JULY VISITOR USE PATTERNS

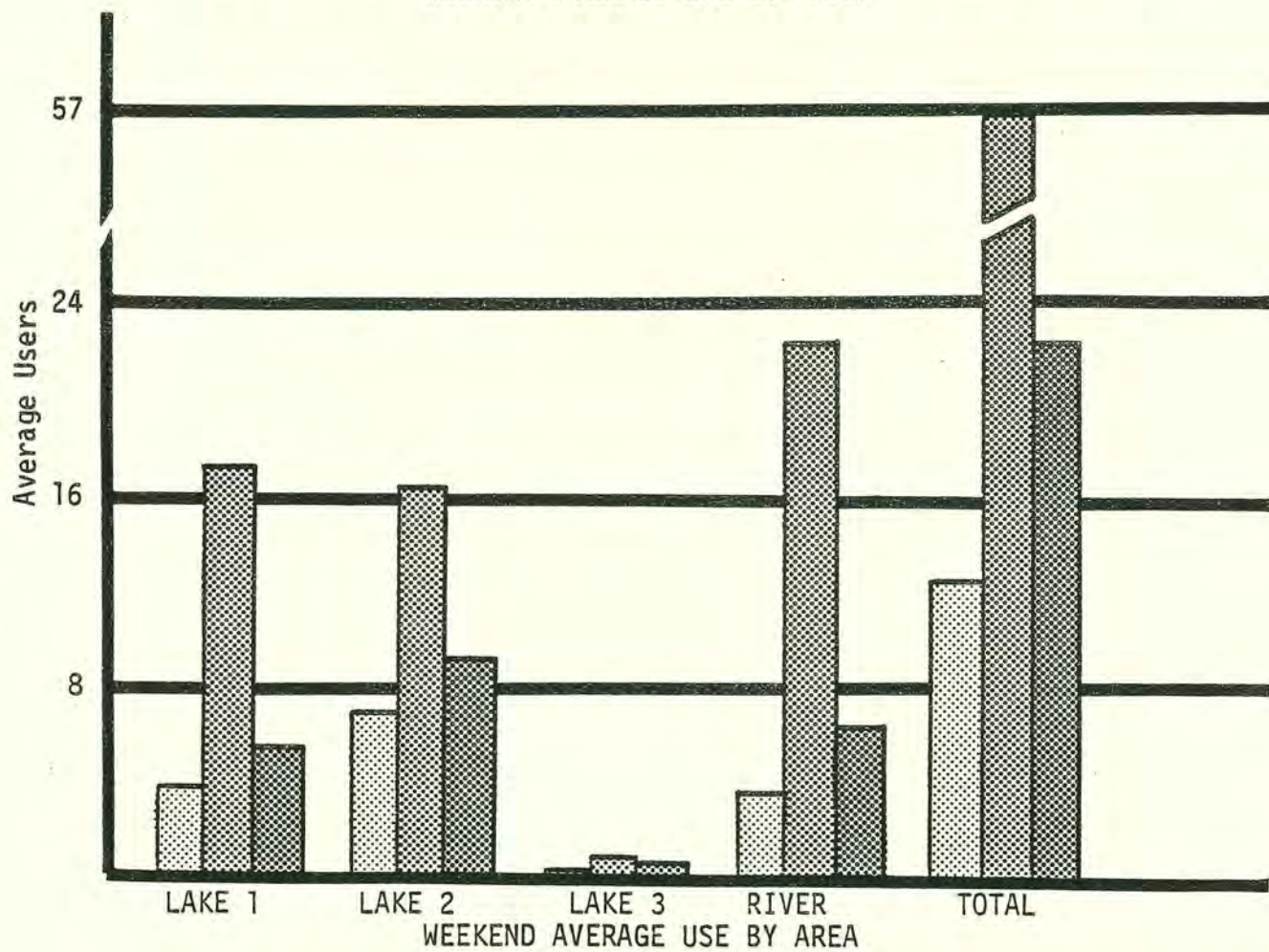
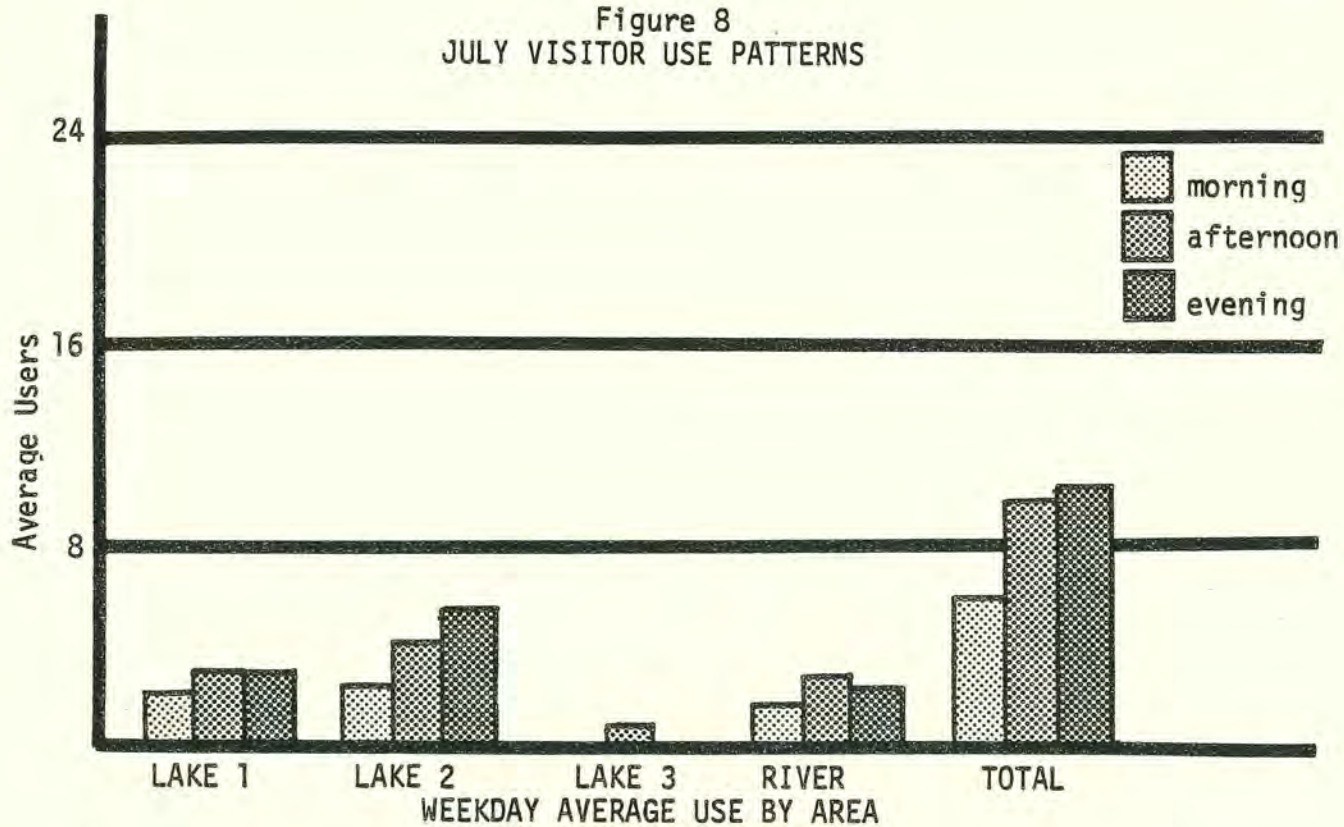
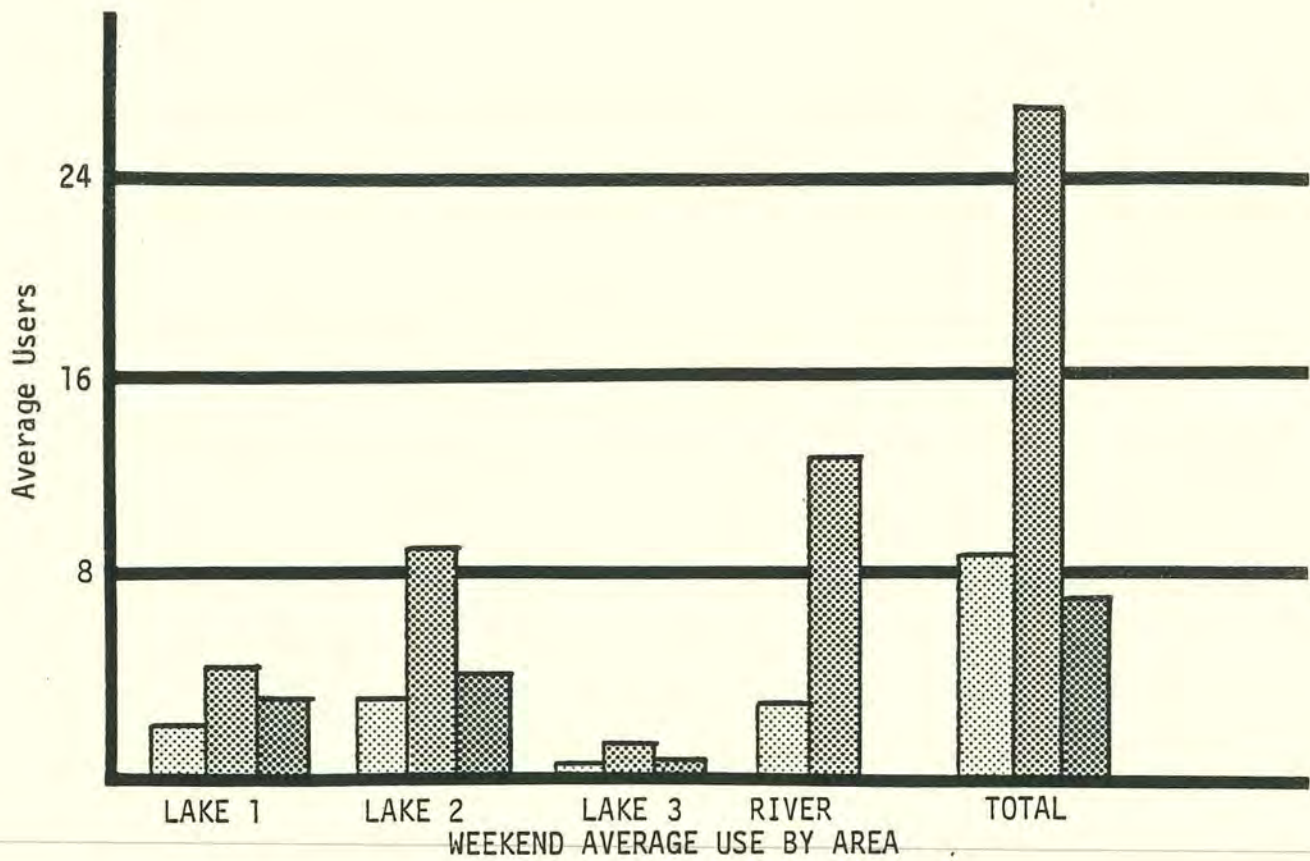
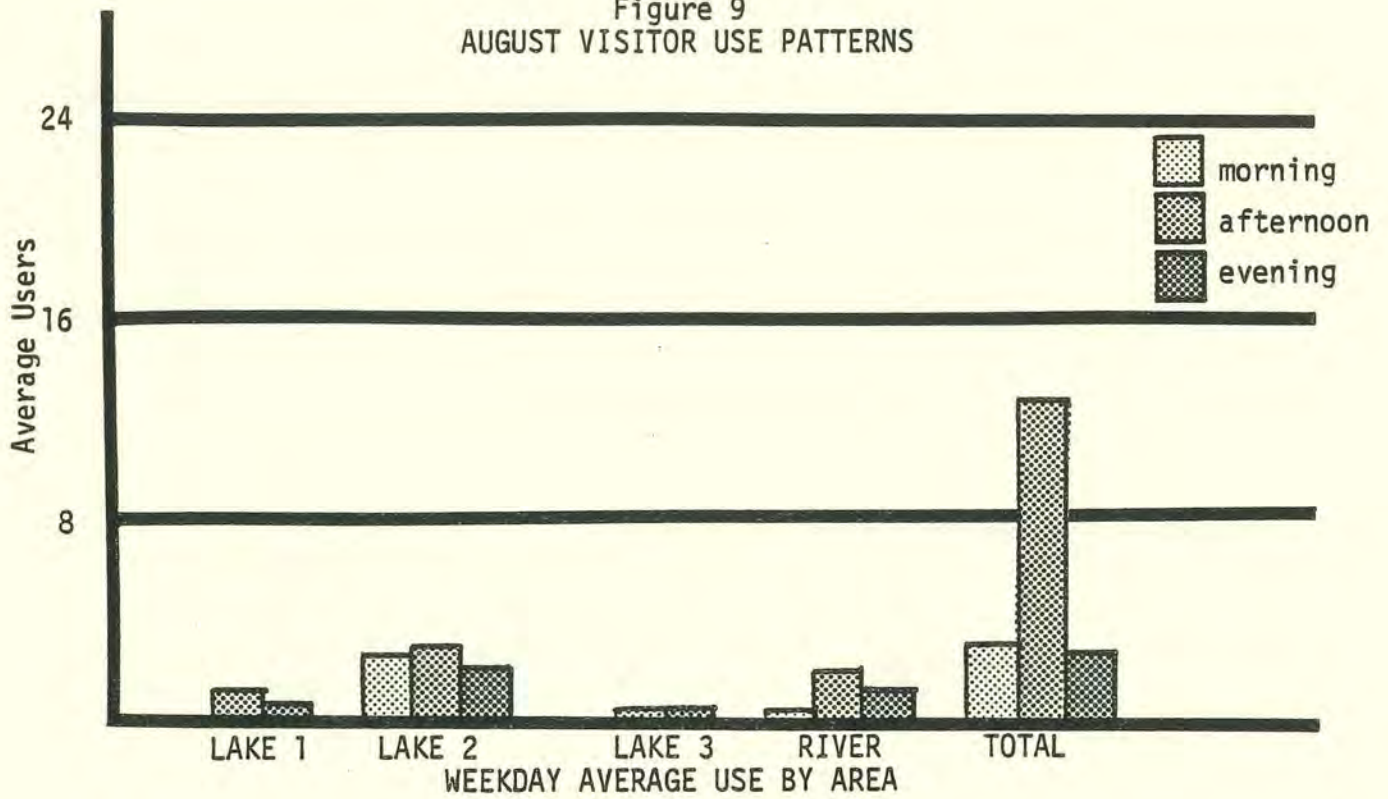


Figure 9
AUGUST VISITOR USE PATTERNS



was made concerning the opening of South Platte Park. With this in mind, the maximum vehicle count (95) and the maximum "head count" (183) indicate a potential for excessively high visitation once a public announcement is made.

VISITOR USE SURVEY

METHODS

The purpose of the visitor use survey was to gain a sensitivity to the current users of the park and to help define their recreational needs and desires. The results should not be construed as being highly scientific but rather as a representation of the feelings of many of the park users.

Fifty parties were randomly selected between July 23 and September 4, 1982. The surveys were carried out by staff conducted interviews primarily during high use periods. All responses were spontaneous, with no questions having categorical answers listed by the interviewer. See Tables 12, 13 and 14 for an overview of survey participants and results.

DISCUSSION

Fishing was by far the most popular activity at South Platte Park during the summer of 1982. River oriented activities such as tubing, canoeing, kayaking and swimming were the next most popular activities. It should be noted that in late June and early July, a large number of traditional park users were contacted concerning swimming in the lakes. The assumption can be safely made that lake swimming was as popular as fishing prior to management by the District, and the subsequent enforcement of the "no swimming" regulations.

The average distance traveled (10.5 miles) may indicate the regional tendencies of the park but may also reflect the visitors who became disheartened by the crowded conditions at Chatfield and found South Platte Park as a substitute.

The three most popular responses for the best use for the area were: fishing (42%), a natural area (27%), and swimming (14%). These desired uses are reinforced by the "one change" responses by those interviewed. The desired changes included: more or larger fish (26%), a swimming area (16%), and no desired change (14%).

Table 12
AGE BREAKDOWN OF USER GROUPS SURVEYED
SUMMER, 1982

AGE BREAKDOWN	MALE	FEMALE
Under 5 years	1%	1%
5-12 years	15%	5%
13-19 years	5%	1%
20-30 years	20%	7%
30-55 years	29%	15%
Over 55 years	<u>1%</u>	<u>0%</u>
	71%	29%

South Suburban Metropolitan Recreation and Park District

Table 13
ACTIVITY PARTICIPATION OF USER GROUPS SURVEYED
SUMMER, 1982

ACTIVITY	PARTIES	(AVERAGE PARTY SIZE)	INDIVIDUALS
Fishing	56%	(2.7)	52%
Raft/Boating	20%	(3.6)	25%
Swimming	8%	(4.3)	12%
Dog Training	6%	(1.7)	4%
Walking	6%	(2.0)	4%
Horseback Riding	2%	(1.0)	1%
Sunbathing	<u>2%</u>	(3.0)	<u>2%</u>
	100%		100%

South Suburban Metropolitan Recreation and Park District

Table 14
SURVEY QUESTIONS AND RESULTS
SUMMER, 1982

1. What town do you live in?
34% replied Littleton
2. Have you been to the park before?
42% yes
10% were traditional users (10 or more years)
3. How did you hear about the park?
60% saw it when they were driving by
17% heard about it from a friend
11% were traditional users (10 or more years)
9% stopped by when Chatfield closed
4% saw it on a map
4. How many miles did you travel to get here?
The average distance traveled was 10.5 miles.
5. Where did you enter the park?
88% entered from Colorado 470
6. How long have you been here?
The average stay was 2 hours and 23 minutes
7. What do you think is the best use for this area?
42% fishing
27% natural/wilderness area
14% swimming
6% "a park"
4% multiple use
4% boating
2% picnics
8. If you could make one change in the area, what would it be?
26% more/larger fish
16% have a swimming area
14% none
12% allow boats or rafts on the lake
8% build trails
6% provide restrooms
6% signs explaining the park
4% more trees, less weeds
4% clean up the river/park
4% improve access

Regional Needs

The purpose, size and quality of the resource at South Platte Park dictates that the area be viewed in a regional perspective. This was accomplished by reviewing the 1981 Statewide Comprehensive Outdoor Recreation Plan (SCORP) produced by the Colorado Division of Parks and Recreation and by looking at the current demands on other regional use areas in the vicinity of the park.

COLORADO OUTDOOR RECREATION PLAN

South Platte Park falls within the parameters of Region 3 in the 1981 SCORP. This is the most densely populated region in the state, with the 1985 projected population density reaching 345 people per square mile. The 1985 projected regional population is 1,751,159 totalling 55.4 percent of the projected state population. The high density of the region requires special consideration in the design of parks and park facilities since high volume use, general abuse and vandalism are inherent in high density regional parks.

As part of the SCORP process, a public needs survey was completed. It was determined that the residents of Region 3 are presently oriented toward high intensive, organized recreational use. However, when the recreation needs (lack of opportunities) of the region were determined, the activities of the highest priority were picnicking, bicycling and day hiking on trails. Other activities receiving the "high" rankings included fishing, ice skating, swimming, golf and developed camping.

A specific recommendation was made for the development of the hike/bike and equestrian trail along the South Platte River corridor. This correlates with the Platte River Greenway Foundation Project which includes an equestrian trail and a surfaced bike/hike trail from Barr Lake State Park south to Chatfield State Recreation Area.

DISCUSSION

Of the "high" ranked recreational needs for Region 3, many can be addressed within the goals of the park. However, others such as golf and developed camping would require more development and construction than is compatible within the goals for the area or possible within the financial constraints. The other "high" ranked activity needs of picnicking, bicycling, day hiking on trails, fishing, ice skating and swimming could conceivably be provided as opportunities depending on the necessary levels of environmental modifica-

tion. However, other environmental, financial and social impacts should be assessed prior to decision-making.

CURRENT AND PROJECTED USE OF EXISTING REGIONAL AREAS

There are four regionally significant, heavily used recreation areas within the parameters of SCORP's Region 3: Barr Lake State Park (2,610 acres), Chatfield State Recreation Area (6,750 acres), Cherry Creek State Recreation Area (4,795 acres), and Golden Gate State Park (8,787 acres). Although the size of the areas and scope of activities exceed those of South Platte Park, their visitor use levels and patterns can be expected to impact the use at South Platte Park to some degree. Chatfield is expected to have the greatest impact due to its proximity to the park, while the use at Cherry Creek is expected to indirectly affect the park. The distance of Barr Lake and Golden Gate State Parks from South Platte Park will probably lessen their effects on the level of usage at the park.

Table 15
VISITOR USE LEVELS AT PROXIMATE
REGIONAL RECREATION AREAS

	Total Visitors 1980-81	Total Visitors 1981-82	% In- crease	Partial Area Closures Summer 82*	Total Capacity Closures Summer 82*	Projected Total Capacity Closures* Summer 83
CHATFIELD	1,112,063	1,130,789	1.68%	n/a	9	25
CHERRY CREEK	1,286,164	1,302,053	1.24%	10	25	35

*indicates area manager's approximations

Colorado Division of Parks, Metro Visitation Report, 1981-1982.

DISCUSSION

The projected capacity closures for the 1983 summer season (see Table 15) are of the greatest concern for the management of South Platte Park. Cherry Creek State Recreation Area has projected capacity crowds on all weekends from Memorial Day to Labor Day, and Chatfield projects closures on all Sundays and some Saturdays during the same season. These closures will displace visitors and, as noted in the discussion of visi-

tor use patterns, many of the displaced users have found South Platte Park as an alternative. The expectations of the displaced visitors may not coincide with the goals of the park and the projected increases in use may yield unnecessary impacts on the park. It is therefore recommended that the primary access point for the park be located in an area other than the major travel route for Chatfield State Recreation Area visitors. This will help to eliminate the park's potential role as an "overflow" for displaced park users.

Environmental Education Needs

The Littleton School District No. 6 has developed several goals concerning environmental education:

1. To expand the regular school experience by extending the learning environment to the outdoors for each student in School District No. 6.
2. To develop a basic understanding of the inter-relationship among all parts of the biophysical community, including the social and cultural aspects.
3. To encourage individuals to place value on the environment and derive enjoyment from it.
4. To develop skills necessary, through learning experiences, to analyze, interpret, and evaluate environmental problems and alternative solutions.

To accomplish these goals, large natural open spaces are necessary. Current budget constraints and rising fuel costs dictate that these areas be close to the schools. At the present time, Slaughterhouse Gulch is the only proximate area. Although Slaughterhouse helps to meet some of the needs of the School District's students, the impact of District-wide use will be significant and development of a diverse 12-year curriculum in an area of that size is difficult.

South Platte Park would be an exceptional addition to both the District 6 program and the programs of other proximate school districts. The size of the park and the diversity of its resources offer potential for a wide spectrum of inter-disciplinary activities.

A major concern in encouraging education in the park is the high risk of impact on the resource. It is recommended that groups be limited to classroom size (approximately 30 individuals if it is a composite group). The need to fill buses for transportation purposes is recognized and it is recommended that full busloads be broken into groups of approximately 30 and disbursed for the field portion of the park visit. In addition, all leaders should attend special in-service training provided by the park staff. The training should include background in low-impact use of the resource, prepared curriculum, potential curriculum areas, and the general regulations and philosophy of the park. Curriculum development should be a cooperative School District/park function to help maintain the quality of the program and the resource.

CONSTRAINTS

Agreements

There are three major agreements that govern the current operation of South Platte Park. A brief overview of each is given below.

FLOODPLAIN MANAGEMENT

U.S. ARMY CORPS OF ENGINEERS/STATE OF COLORADO WATER
CONSERVATION BOARD : STATE OF COLORADO WATER CONSER-
VATION BOARD/CITY OF LITTLETON

These agreements enable the City of Littleton to purchase and retain the property in South Platte Park and delineate general operating and management guidelines. More specific guidelines are to be forthcoming from the Army Corps of Engineers in an operations and management manual following the completion of the channelization project.

GRAVEL OPERATIONS WITHIN THE PARK

CITY OF LITTLETON/CENCO LAND COMPANY, COOLEY GRAVEL
COMPANY, ALPHA LAND COMPANY, CASTLEWOOD INVESTMENT
COMPANY

These agreements allow for the continued mining operation in the northwest section of the park for a maximum of twelve years. Points of access for the mining operation, hours of operation and other specifics are detailed. In addition, the agreements allow for the lease of approximately 3.5 acres surrounding the former golf course clubhouse (now owned by the City of Littleton) until one year after the final plat is filed on that property.

PARK MANAGEMENT AND OPERATION

CITY OF LITTLETON/SOUTH SUBURBAN METROPOLITAN RECREA-
TION AND PARK DISTRICT

The pending agreement provides for the fulltime planning, management and operations within South Platte Park. It serves as an addendum to the existing agreement for park and recreation services and management between the District and the City of Littleton.

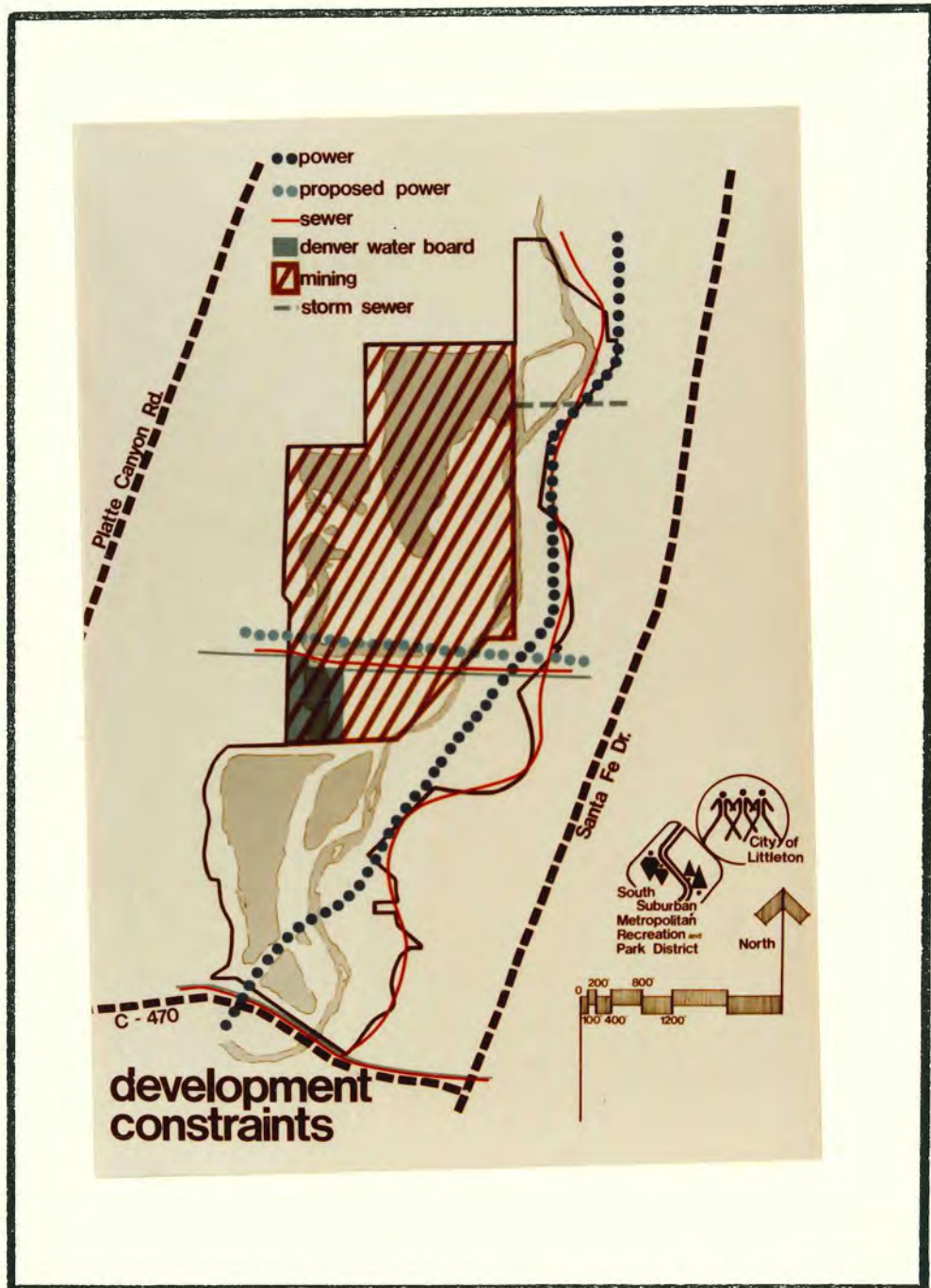


Figure 10: MAP OF DEVELOPMENT CONSTRAINTS

Adjacent Development

UTILITY EASEMENTS

Several easements of varying widths exist within the park boundaries. All of them require access at all times and require permission and prior arrangements for gates in any fenced areas. See Figure 10 for map.

Contacts for details on existing easements are as follows:

North Sewer Easement	Charlie Blosten, Public Works City of Littleton 2255 West Berry Avenue Littleton CO 80165
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Water Lines (12 acre parcel; 20 foot easements):	Bob Panesi Denver Water Board 1600 West 12th Avenue Denver CO 80254
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Public Service (75 feet wide):	Jack H. Muir Public Service Company 5909 East 38th Avenue Denver CO 80220
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Sewer Lines (average, 25 feet wide):

North/South Line:	Patrick Fitzgerald Southwest Metro Water and Sanitation District 7677 Ken Caryl Road Littleton CO 80123
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Interceptor along C-470:	Gerald Groothius Ken Caryl Water and Sanitation District 10579 Bradford Road Littleton CO 80127
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PROPOSED LINES

Public Service Company has proposed a major transmission line from the existing line to a proposed substation to be located on the central west boundary of the park. This will require the erection of wooden towers similar to those on the existing line. It appears that the proposed line will be in conflict with the Floodplain Agreement with

the Army Corps of Engineers and may require a change in Public Law 93-251. The construction of the line will cause a significant impact on the resource and revegetation with native grasses and wildflowers should be required. The visual impact of the completed line will be significant and is considered contrary to the proposed theme of the park.

Southwest Metropolitan Water and Sanitation District has cited a need within the next ten years for a supplemental sewer line paralleling the existing north/south line. It should be urged that the new line run outside the park boundary to minimize construction impacts.

PROPOSED ADJACENT DEVELOPMENT (Figure 11)

The north boundary is adjacent to the Town of Columbine Valley. The proximate development is typified by single family dwellings and open space (golf course).

The land lying between the eastern park boundary and Santa Fe Drive has been reviewed as part of the South Santa Fe Corridor Study. The only residential development included in the study is Wolhurst Landing, situated on the north end of the study corridor. The development is anticipated to have a maximum of 189 townhomes and 40 single family dwellings. Much of the land is proposed for use as office parks and retail commercial development. Wide areas of open space have been recommended to provide vistas of the park and the mountains. In addition, there is the possibility of a private lake and recreation facility to be developed where the turf farm is currently situated. The Corridor Study also recommended the acquisition of a 150 foot easement adjacent to the park boundary to serve as a buffer and possible road.

The central portion of the western boundary to Platte Canyon Road will be largely incorporated into the Cooley mining operation for the next five years. Post-mining plans include the "Lakes at Grant Bench" development which has a maximum of 916 residential units conceptualized.

The southwest boundary lies adjacent to Peter Kiewit Son's Company gravel stockpile. No long range plans are known for that area. It is assumed that their current operations will continue indefinitely.

The long range plans for the remainder of the adjacent property along the western boundary of the park are undetermined at this time.

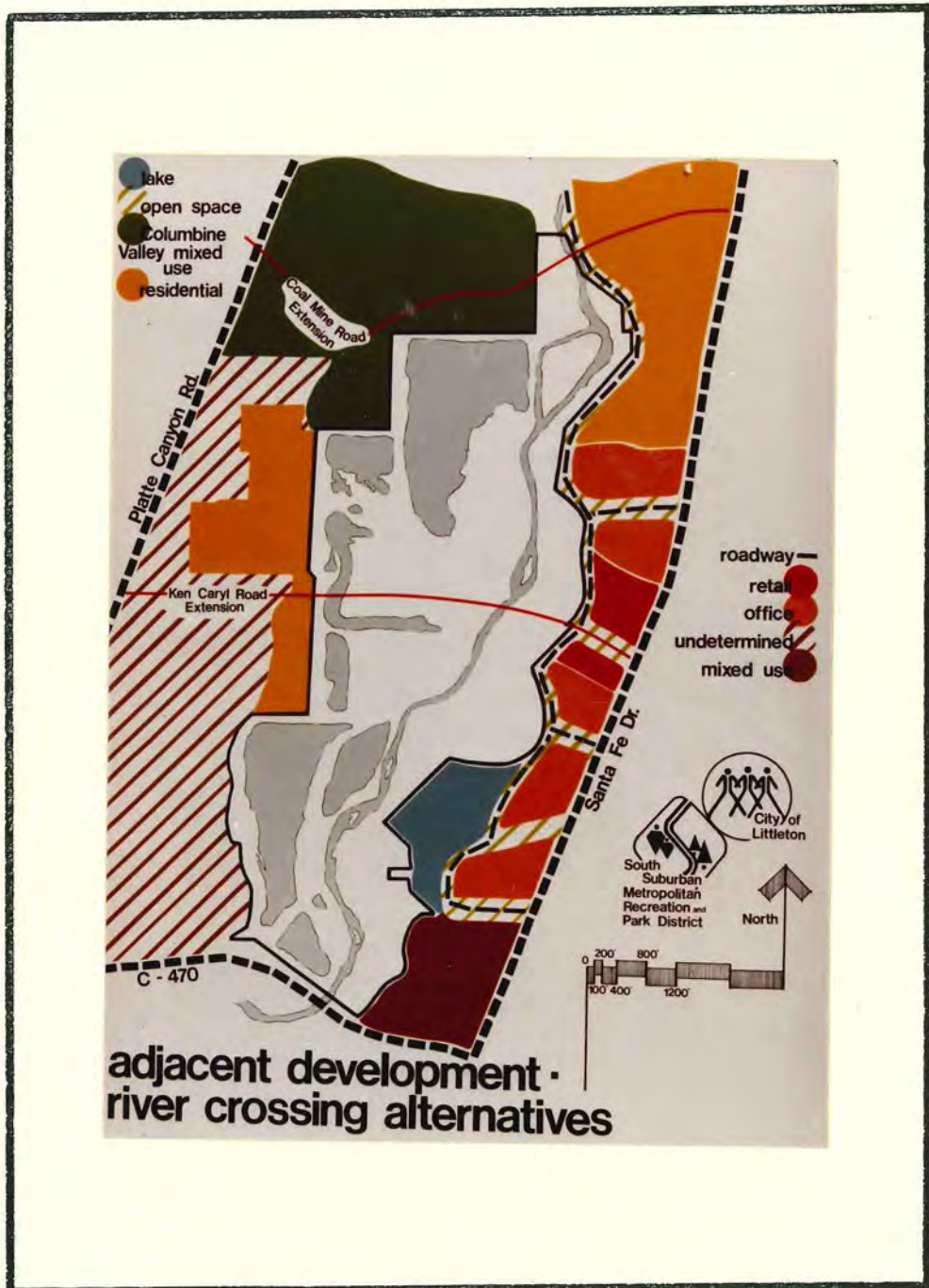


Figure 11: PROPOSED ADJACENT DEVELOPMENT AND RIVER CROSSINGS

The southern boundary lies adjacent to Colorado 470. It is anticipated that the closed access highway will be completed within five to seven years. See the ACCESS Section for further discussion.

RIVER CROSSINGS

Planning efforts are currently underway to determine the most appropriate location for an additional river crossing. These efforts are a result of the traffic problems that currently exist on Bowles Avenue, and the need to disperse the concentration of traffic in that area. Three alternatives (in addition to "no build") have been discussed and can be reviewed in detail in the South Platte River Crossing E.I.S. produced in September, 1982, by the Colorado Department of Highways. Briefly, the alternatives are:

1. Extend Ken Caryl Road across the center South Platte Park to connect with Mineral Avenue, and widen Bowles Avenue to four lanes.
2. Widen Bowles Avenue to six lanes between Santa Fe Drive and Platte Canyon Road.
3. Extend Coal Mine Road from Glenridge Drive to Santa Fe Drive, and widen Bowles Avenue to four lanes. This alternative would cross the northernmost tip of the park.

RECOMMENDATIONS

The proposed residential development on the west side of the park will present a significant impact without the careful planning of access points. It is recommended that one pedestrian access point be provided and that barrier vegetation be planted along the entire park boundary. Public information programs should be presented to the residents of the community.

The proposed office and retail district on the east side will present its primary impact during the noon hours of the business week. Public information programs should be presented to employees to minimize impact. It is recommended that the proposed north-south road be a winding, gravel surfaced road, a maximum of 30 feet wide, and accessible only during the operating hours of the park. Parking should remain limited to the designated public access point, and roadside parking regulations should be strictly enforced.

The undetermined use areas are well suited for retail, office or residential areas. In all cases, low density use should be encouraged and care taken to designate controlled points of access to the park.

Since the northern portion of the park will be surrounded by residential development, it should be anticipated that impact in that area will be significantly higher than the southern portions of the park. Design for that area should incorporate carefully planned pedestrian access points and trail systems.

If the Ken Caryl river crossing is determined to be the best choice of all the alternatives, certain design features should be included to minimize the impact of the road and accompanying traffic on the resource. A specific master plan will be developed and recommendations made as a contingency for this possibility.

Access

CURRENT VEHICLE ACCESS

At the present time, the only public vehicle access to the park is from the west-bound lane of Colorado 470. The access points are a steep, low visibility embankment and a dirt track crossing the highway easement. The parking area is situated on a 200 foot (approximately) strip of property owned by the Army Corps of Engineers, and lying between the State highway easement and the park boundary. That property has traditionally been an area of abuse and misuse, has been treated as a dumping ground, and has no formal roadway or parking lot surfacing.

Access off Colorado 470 presents some significant concerns to the District in its management of the park, with safety of the visitor being the foremost. The slope of the turnoff limits visibility and several vehicles have been observed turning east into the west-bound lane. In addition, the parking area lies over a water line and sewer line. The exposed manhole covers present a hazard to the unwary motorist.

The proximity to the lakes and the high visibility from a major thoroughfare presents a threat to the preservation of the resource. In addition, the access point lies directly enroute to Chatfield Recreation Area.

Law enforcement problems have been evidenced in this area as well. Since the property is owned by the Army Corps of Engineers, and lies in unincorporated Arapahoe County, the South Suburban Park Police and Littleton Police have no jurisdiction on the parking area. The Arapahoe County Sheriff is reluctant to enforce regulations that are not posted by the property owner. The consequences are large parties (up to 500 people, with portable generators, live music, etc.) resulting in truckloads of trash and no feasible method of enforcement.

The State Highway Department has also indicated concern over the access now being used. The final plans for Colorado 470 indicate controlled access only and that the access to the park is in essence illegal. Completion of the highway is anticipated within five to seven years and access to the park will be eliminated by that time.

CURRENT PEDESTRIAN ACCESS

Two points of pedestrian access originate from the Wolhurst community. The access is used by residents only (the no parking regulations

are strictly enforced) and connects to an informal trail system developed by the residents.

An additional attempt at pedestrian access is provided by a sidewalk leading from Wolhurst Landing to within 90 feet of the park boundary. The sidewalk ends at a City of Littleton utility easement lying on property owned by the Newton Trust. A fence has been erected by an adjacent landowner in an effort to block access to the river.

RECOMMENDATIONS

The well-being of the resource will depend on limited use and careful design of access points. The river provides a natural barrier separating the east and west portions of the park. It is anticipated that the lake (west) region will be the subject of most visitor attention. Therefore, it is recommended that only one point of vehicle access and a small parking area be located on the east side of the river, off Santa Fe Drive. The provision of a river crossing in an appropriate area will effectively channel the visitor to the zone which is most capable of supporting use. This will provide access to the lake region without high visibility.

A visitor information center should be located adjacent to the parking area. Therefore, the exact location of the access easement will depend on the suitability of the area to support the structural development.

The design of the access road should be characterized by several curves and sufficient vegetation buffers. The road should serve as a transition between the activity of Santa Fe Drive and the subdued nature of the park.

Concurrent to the construction of an east access point, the Colorado 470 access should be closed. The closure should be designed and constructed by the Highway Department. The City of Littleton should acquire or lease the property lying between the highway easement and the park boundary.

PEDESTRIAN ACCESS

The number of pedestrian access points should be minimal and connect directly with the transport trail. Access should be negotiated with any adjacent development and should require the approval of the District prior to designation. There should be a maximum of one access

point per subdivision and the total number of pedestrian access points should not total over four on each side of the river. A northwest access point should be avoided, since the Town of Columbine Valley does not want any access from the golf course to the northwest corner of the park.

The City of Littleton should begin negotiations to obtain pedestrian easement over the utility easement immediately, and formalize a pedestrian access from Wolhurst Landing.

Wolhurst Mobile Home Community access should be limited to a trail designated by the park staff and connecting to the transport trail. Construction and maintenance of additional trails should cease, unless under the direction of the District.

Analysis of Activities

PURPOSE

The purpose of the activity rating was to help eliminate personal biases and preferences in activity evaluations through impact/goal comparisons completed by a variety of people. It is not intended to produce clear-cut, undisputable acceptance or rejection of activities.

Methods

Several staff members acquainted with the resources of South Platte Park evaluated a variety of activities and their potential impact on the park. Each activity was evaluated on a scale as follows:

High impact (negative)	1
Moderate impact (neutral)	2
Little to no impact (positive)	3

The impacts were then weighted according to the priorities given in the goals for the park. The weights assigned to the impacts were as follows:

<u>Goal</u>	<u>Impact</u>	<u>Weight Factor</u>
1	Impact of activity or its required development on the management of the floodplain.	6
2	Impact on the resource caused by the activity or its required development.	4
2	Suitability of the resource for the activity or its required development.	2
3	Cost of providing the activity or its required development.	2
3	Potential enforcement problems caused by the activity.	1
3	Potential safety problems caused by the activity.	1
3	Applicability of the activity to help meet the regional needs established by the SCORP.	1
3	Impact of the activity on the experience of other non-participating visitors.	1

Example

Canoeing in the river and its required development was evaluated by an individual as having little to no impact (3) on the management of the floodplain (weight factor of 6). The evaluation was multiplied by the weight factor and the activity rating was determined:

$$\begin{array}{ccccccc} 3 & & x & & 6 & & = & & 18 \\ \text{(evaluation)} & & & & \text{(weight)} & & & & \text{(rating)} \end{array}$$

Evaluations were done for all the impacts noted above and a total rating for each activity was determined. The average rating and the range of the ratings for all evaluators are noted in Table 16.

DISCUSSION

The ratings of the activities should serve only as guidelines in the management process. Many impacts will change as use increases and re-vegetation programs are accomplished. However, it is apparent that the passive, non-motorized activities were the most acceptable to evaluators.

Table 16
RESULTS OF POTENTIAL ACTIVITY EVALUATION
SUMMER/FALL, 1982

ACTIVITY	RANGE	AVERAGE	ACTIVITY	RANGE	AVERAGE
Photography	53-54	53.43	Swimming	19-54	38.1
Nature Study	51-54	53.0	Model Airplane Operation	18-50	34.4
Hiking	49-54	52.7	Model Boat Operation	18-48	33.9
Canoeing	50-54	50.4	Archery	18-47	33.7
Innertubing	44-53	50.0	Non-motorized Boating	18-48	33.6
Kayaking	44-53	50.0	Dog Training	18-46	33.4
Picknicking	38-54	48.0	Camping	18-46	33.0
Jogging	40-53	47.4	Snowmobiling	18-39	28.0
Bicycle Riding	42-52	47.3	Skeet Shooting	18-41	27.9
Fishing	31-50	44.6	Target Shooting (Rifle)	18-40	27.6
Ice Fishing	18-51	41.4	4-Wheel Drive Vehicles	18-39	26.7
Ice Skating	18-53	39.9	Motorcycling	18-39	26.6
Horseback Riding	21-49	39.6	Hunting	18-33	25.4
Cross Country Skiing	20-52	39.6	Motorized Boating	19-33	25.4

South Suburban Metropolitan Recreation and Park District

Financial Analysis

SUMMARY OF REVENUE AND EXPENSES AS OF JANUARY, 1983

REVENUE

Bond Proceeds		\$ 400,000
State of Colorado (Water Board Grant)		200,000
State of Colorado (L.W.C.F.)		146,424
HUD Open Space Grant		136,799
US Army Corps of Engineers:		
Reimbursed	\$385,392	
Receivable (Billed 12/12/82)	241,278	
Uncommitted	<u>129,930</u>	756,000
Interest (estimated through 1982)		<u>94,331</u>
	TOTAL	\$1,733,554

EXPENSES

Land Acquisition (Paid)	\$1,094,622
Land Acquisition (Deposit)	83,500
Closing Costs, Appraisals, Survey Fees, Engineering, Legal Fees	154,668
Park Study and Design (1975)	35,362
Park Study and Management (1982)	34,500
Bond Issue Costs	8,487
Miscellaneous	<u>5,940</u>
	TOTAL
	\$1,417,079

Balance of Anticipated Available Funds	\$ 316,475
Capital Improvements	\$ 189,344
Land Acquisition	\$ 127,131

SUMMARY OF LAND COSTS
AS OF
DECEMBER 31, 1982

PARCEL	ACRES	ACQ. COST	USACE FUNDS	OTHER FUNDS	REIMB. TO DATE	REIMB. DUE
Cenco/Cooley	231.19	\$ 275,000	\$275,000	\$ 0	\$ 275,000	\$ 0
Central Const.	2.92	55,730	45,382	10,438	10,348	45,382
Codeca	25.30	86,000	0	86,000	86,000	0
Cooley "A" & "B"	111.65	27,992	27,992	0	27,992	0
Denver Water	12.00	26,300	26,300	0	26,300	0
Ensor "A" & "B"	101.90	350,000	0	350,000	350,000	0
Ensor "C"	0.86	0	0	0	0	0
Hobby Horse	0.34	8,500	8,500	0	0	8,500
Morris	23.00	57,500	0	57,500	57,500	0
Newton "A"	48.90	160,000	0	160,000	160,000	0
Newton "B"	3.32	55,000	55,000	0	55,000	0
Olsen	59.90	75,000	75,000	0	0	75,000
Reimer/Monen	4.14	1,100	1,100	0	1,100	0
TOTALS	625.42	\$1,178,122	\$514,274	\$663,848	\$1,049,240	\$128,882
			<u>\$1,178,122</u>		<u>\$1,178,122</u>	

1. Central Construction: 2.44 acres within USACE acquisition limit (\$45,382); 0.48 acres outside USACE acquisition limit (\$10,348) to be paid from DHUD funds. Total of \$55,730 is amount deposited with District Court for immediate possession and subject to change due to eminent domain proceedings.
2. Ensor "C": Property owner has indicated his desire to give this 0.86 acre parcel to the City as a charitable land donation.
3. Olsen: Cost represents amount set by District Court for immediate possession. Final cost subject to change due to eminent domain proceedings.

SUMMARY OF USACE FUNDS
AS OF
DECEMBER 31, 1982

1.	\$385,392.00	Land acquisition paid to date by USACE
		Associated expenses to date:
		\$145,496.32 (Legal, Engineering, Appraisals)
		- <u>33,100.00</u> (Reimbursed)
		\$112,396.32 (Balance billed 12/12/82)
		Unreimbursed land acquisition costs
		\$ 83,500.00 (Billed 12/12/82)
2.	\$195,896.32	Total December 12, 1982 billing
3.	\$ <u>45,382.00</u>	Land acquisition costs not billed. (Central Construction)
	\$626,670.32	Total USACE Fund expenses or committed (1+2+3)
	\$756,000.00	Maximum USACE Funds (without additional local match)
	\$129,329.68	Total uncommitted USACE Funds

SOUTH PLATTE PARK FUND
AS OF
DECEMBER 31, 1982

ASSETS

Savings	\$43,183.47	
Equity in Pooled Cash	<u>3,796.09</u>	
Total Cash and Investments		\$ 46,979.56
Receivables: Army Corps of Engineers		<u>195,896.32</u>
TOTAL ASSETS		<u>\$242,875.88</u>

LIABILITIES

Advance from Public Facilities Fund	<u>\$55,730.00</u>	
TOTAL LIABILITIES		\$ 55,730.00

FUND BALANCE

187,145.88

TOTAL LIABILITIES AND FUND BALANCE

\$242,875.88

Available Funds, assuming receivable from Corps of Engineers is valid and forthcoming	\$187,145.88
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If receivable from Corps of Engineers does not materialize, Cash Balance is	(\$8,750.43)
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RECOMMENDATIONS

HISTORICAL AND CULTURAL PRESERVATION

1. Cooperate with the Littleton Historical Museum in the continued study and documentation of the early uses of the South Platte River and the early habitation along the river.
 - a. Recruit and conduct oral histories of the residents and former residents of the Platte River Valley.
 - b. Collect and copy any photographs of the park area prior to excavation or major flooding.
2. Careful observation of any excavated area, erosion prone areas and the river bottom for fossils and artifacts. When articles are found, notify the proper agency for the preservation of such articles and determine if preservation of the site is necessary before excavation or visitor use continues.
3. In association with the Littleton Historical Museum, develop interpretive programming to include living history of early exploration, signage designating old home sites, brochures describing the valley's historical features, and other associated services.

RESOURCE MANAGEMENT

1. Phase plantings of suitable indigenous species which will result in a high volume of duff, promote soil stability, increase habitat areas, and increase the carrying capacity for both wildlife and visitors in the park.

- a. Plant willows and natural grasses on lakesides and berm areas to promote stabilization.
- b. Plant poplars, narrowleaf cottonwood and plains cottonwood in large groves scattered throughout Zone 2. These groves should be characterized by irregular spacing and edges to promote self-propagation and increase the capacity as wildlife habitat. Large open corridors should remain for wildlife and visitor movement and to encourage a mixed age stand. Several spot plantings of eight to ten trees should be scattered throughout Zone 2 as wildlife cover, buffers for visitor use and to define visitor use areas.
- c. Plant (broadcast) a high nutrient groundcover (sp. Lespedeza) as a stabilizer, edge habitat, forage and soil builder throughout the interior of Zone 2.
- d. Maintain and enhance the grasslands in the northern portion of Zone 3 and the eastern portion of Zone 1 as pheasant and ground bird habitat.
- e. Plant layered, dense vegetation along the boundaries of the park to discourage vehicle access, prevent domestic animals and to define visitor access areas. A possibility would be a hackberry, chokecherry, plum, blackberry, grape and rose mixture. Berries should promote bird habitation along the edge portions.
- f. Preserve all standing dead timber for heron roosting and cavity nesters.
- g. Preserve the natural revegetation process in the western portion of Zone 1 (the old riverbed), using the area as an educational tool and documentation of succession process in nature.
- h. Work closely with Cooley Gravel Company in the selection of species used in their reclamation work in Zone 3.
- i. Carry out intensive noxious and undesirable weed control through spot treatment with "Round-up" herbicide and handcutting. Other chemicals should be introduced only as emergency measures and under the direction of weed control specialists.

2. Monitor and document resident and migratory wildlife.
 - a. Preserve all areas noted as dense feeding areas, nursery or bedding areas through routing of visitors and partial or total closure when deemed necessary.
 - b. Under the advisement of C.D.O.W., remove resident wildlife which exceeds the carrying capacity of the resource due to lack of predators and which causes damage to the habitat of other species and/or property outside of the park boundaries. The beaver population, for instance, should be stabilized at two colonies on the river to minimize vegetation damage and maximize visibility.
3. Dredge a channel (not to exceed 200 feet wide) between the northern tips of Lake 2 and Lake 3. Soften the shoreline of the lakes by cutting back and filling portions of the shoreline to give a more natural, less harsh edge, characterized by oxbows and inlets. Widen the berm between Lake 3 and the river by filling the eastern shoreline with the gravel dredged from the new channel. (Care must be taken to maintain approximately the same total surface area of water that currently exists to prevent excess evaporation.) The new berm should be reinforced with rock and vegetation to prevent further erosion from wave action and river current. Technical assistance on maintaining the river's edge should be obtained from the U.S.A.C.E.
4. Remove the abandoned sewer line from the river.
5. Lease the mineral rights in the settling basin (upstream of the training dikes) to a gravel operator, to keep the area free from silt and debris buildup, and to provide park income.
6. Monitor fish populations and work closely with the C.D.O.W. in their prescription program.
7. Encourage a diversity of quality fishing experiences through specialized habitat enhancement programs, stocking and subsequent regulations and permits.
 - a. Fishing will occur only if it does not result in direct damage to any other resource in the park.
 - b. Interpretive programming should include fisheries management and conservation oriented fishing programs.

8. Swimming in any of the lakes should not be permitted because of the potential damage to the resource and the level of development necessary to support the activity.

9. Prohibit hunting and trapping unless prescribed and sanctioned by a special permit (see 2.b.).

VISITOR USE

1. Define one main visitor access point at which information can be distributed and permits issued.

- a. Acquire an easement from Santa Fe Drive to the park boundary in the central portion of the park (south of the Cooley Gravel entrance) for public access. A parking area (30 to 50 vehicles) should be prepared adjacent to the east boundary.
- b. The C-470 access point should be closed immediately by the Colorado Department of Highways.
- c. Acquire pedestrian access from Wolhurst Landing, crossing the storm sewer easement.
- d. Work with developers to establish pedestrian access from adjacent subdivisions and business parks, keeping the number of access points to a minimum.
- e. Define pedestrian access points with vegetation and appropriate signage.

2. Develop environmental education curriculum for all experiential loops.

- a. Encourage interdisciplinary programming.
- b. Multi-level experiences should be prepared by including pre-trip orientation and follow-up presentations.
- c. Park staff should continue to work closely with school districts in the development of any curriculum used in the park to stress the best use of the resource and low impact ethics needs of the area.

3. Prepare and present in-service workshops to teachers to insure the most effective use of the park and the least amount of impact.

- a. Attendance at a workshop would "certify" the individual to lead groups.
- b. Brief interviews with the more experienced staff members would suffice in assuring the park staff of knowledge in low impact use.

4. Summer environmental education programs, interpretive programming and minimum impact outdoor education workshops should be provided by the park staff and advertised through the South Suburban brochure as pre-registration programs.

5. Public education programs should be provided to homeowner associations and adjacent businesses to acquaint people with the resources and the opportunities of the park.

6. Passive, quiet opportunities should be encouraged. This includes, but is not limited to, birdwatching, wildlife observation, wildflower identification, limited fishing, non-motorized boating (in specified lakes and the river), tubing and rafting in the river, hiking, biking and horseriding on trails, and picnicking (no facilities provided). The opportunities should be accompanied by solitude or the opportunity to a relatively solo experience.

VISITOR MANAGEMENT

1. Immediately implement a visitor education program through signage, brochures and public education to inform the public of the long range plans for the park.
2. Monitor visitor use and implement a permit, quota, or user fee system when total use approaches the capacity of the area; this management technique to be implemented when a centralized entrance is established.
3. Acquire horses for the patrol of the park.
 - a. Horses should be ridden one year prior to public patrol to assure even temperament and tolerance of visitors.
 - b. The horses could be boarded at adjacent farms or a grazing/stable area could be established near the visitor center with a sufficient buffer to help eliminate odors.
 - c. The potential exists for using the horses for patrol of the entire riverfront area throughout Littleton.
4. Implement a specialized permit, quota, or user fee program for fishing to disburse use, limit harvest, and provide a quality fishing experience. Actual regulations and levels of use will depend on the stocking patterns and enhancement program designed by C.D.O.W.
5. Monitor the quality and level of the water in the river and the lakes.
 - a. Notify the proper agency and close the river and/or lakes if a water quality problem develops.
 - b. Close the river to visitor use if dangerously high volumes are released from Chatfield.
 - c. Post warning signs at dangerous crossing areas and, additionally, post disclaimers of visitor use on the river.
6. Bicycling and horseback riding will be limited to trails designated for those purposes.
7. Non-motorized boats not requiring body-water contact for their operation will be permitted in designated lakes only and operated under a permit and quota system.
 - a. The permit, quota, or fee system should operate under a lake capacity (social and biological) determined annually for the designated lake.

- b. Permits should be issued for boats passing a safety inspection and carrying the necessary number of life jackets.
 - c. No motorized access should be provided for boats to the lakes, i.e., boats will have to be carried from the standard visitor entrance area.
 - d. A permit system should be implemented only after a visitor center is established.
- 8. Motorized boats, vehicles, or remote control sports will be prohibited.
- 9. Organized sports will not take place in the park.
- 10. Group size will be limited to 10 people for recreational outings and 30 people for educational outings under the guidance of a trained leader.
- 11. No alcoholic beverages will be allowed in the park.
- 12. Park use will be limited to the daylight hours except by permit for special evening programs not to include overnight activities.
- 13. Visitor use of the park will be limited to:
 - a. Zone 1 and Zone 2 during Phase I and Phase II (1983-1996 approximately). No use other than mining activities should occur in Zone 3.
 - b. Zone 1 and Zone 3 during Phase III (1996-), except by special use permit.

TRAILS

1. Trails in the park should be characterized by one of the following descriptions:

a. TRANSPORT TRAILS characterized by:

- (1) Multiple use: Bike/Hike/Horse unless use exceeds capacity and horse trail is separated from the general use trail.
- (2) Accommodation for wheelchair use.
- (3) Avoidance of sensitive habitat areas.
- (4) No grades in excess of 7 percent.
- (5) Headspace a minimum of 8 foot.
- (6) Minimum width of 8 foot, maximum width of 12 foot.
- (7) Rest areas located in natural clearings whenever possible and requiring only minimal vegetation clearing.
- (8) Rest areas should provide an area suitable for sitting and whenever possible, a natural object should be used, i.e., a log, large rocks. Standard park benches should be avoided.
- (9) Soft lines and curves should be designed in the trail and sight lines should be provided on curves and at the crest of hills.
- (10) The trail should be designed with solitude and quiet in mind and should carry the visitor through a variety of environments.
- (11) Surface preparation may include paving after a trial period of non-paved use.

b. EXPERIENTIAL TRAILS characterized by:

- (1) Designed to provide a specific experience rather than to provide a route from point A to point B.
- (2) Pedestrian use only.
- (3) Preparation will include vegetation trimming and use of herbicide.
- (4) Water bars and fill may be used if necessary to stabilize the trail and provide for visitor safety.

- (5) 40 inch maximum width, 6'6" minimum height.
- (6) Trails should loop off of the transport trails.
- (7) Accommodation for wheelchair use.
- (8) Several natural clearings capable of supporting group gatherings and rest stops should be incorporated.

2. A transport trail should be developed immediately on the east side of the river to connect with the planned Platte River Greenway Trail and follow similar design and construction standards. Dirt surfacing should be used for one full year prior to surfacing to test stability and acceptability to public use, unless contract commitments require immediate surfacing.

SIGNS

1. A general theme in design should be developed to raise visitor awareness of the purposes of the park. This could be in the form of a logo, graphic design, style of lettering, etc.
 - a. The theme should be clearly expressed on all signs, brochures and public information programs.
 - b. The theme should serve as a non-verbal reminder of the philosophy and regulations of the park.
2. Signs should be placed at all entrances to the park. Verbiage should be minimal and positive in nature.
3. All regulatory signs should remain positive, explicit and minimal in number.
4. Interpretive signs should display non-verbal as well as verbal messages.
5. Long range plans should include the purchase of small tape recorders and the preparation of interpretive tapes to aid the sight impaired on interpretive experiences. Braille trails would also be an excellent addition to the interpretive trail program.
6. Safety and warning signs on the transport trails should adhere to state standards.

STRUCTURAL DEVELOPMENT

1. Minimal structural development should occur because of both the unstable physical nature of the floodplain and the efforts to keep the park as natural as possible.
2. Any development should be designed to blend into the surrounding land scape and theme of the park.
3. Specific site analysis should precede any development to determine the suitability of the soils and the depth of the bedrock to support any major structure.
4. Notification of and approval by the U.S.A.C.E. must precede any development.
5. A visitor information/education center should be constructed on the east side of the river, outside of the designated erosion limits.
 - a. Should be constructed with the flood control element considered in both theme and structure.
 - b. Built for year-round operation of environmental education classes, interpretive programming, outdoor education workshops, and possible meeting space for community groups.
 - c. Encourage supplemental volunteer staffing.
 - d. Installation of permanent and temporary (seasonal) displays and exhibits discussing the philosophy, resources and regulations of the park, and the history of the South Platte River Valley.
 - e. Environmental education and interpretive exhibits should encourage the "touch and learn" experience and serve as preparation or followup to actual experiences in the park.
 - f. Public restrooms, office space and storage facilities should be provided at the visitor center.
6. Construction of a modular river crossing:
 - a. It may be desirable to coordinate design with the bridges constructed along the Platte River Greenway.
 - b. Crossing must be designed to withstand 5000 CFS and have the capability of being moved to a new location.

7

MASTER PLANNING
ALTERNATIVES

Phasing Plans

PHASE I

Phase I, beginning in 1983, will be characterized by the preparation of Zone 1 for visitor use, and the concurrent reclamation of Zone 2. During this period, the primary use area will be Zone 1 since no river crossing will be available. Zone 1 will provide 182 acres for visitor use.

Development of a formal vehicle access point and parking area in Zone 1 will be the high priority in Phase I. Other priorities include:

1. Development of a north/south transport trail on the east side of the river.
2. Development of an experiential trail in the:
 - a. Southeast corner of Zone 1 (intermediate forest, natural succession).
 - b. West central section of Zone 1 (river flooding, intermediate habitat areas, nesting birds).
 - c. Northeast corner of Zone 1 (climax forest, river flooding, man's relationship to the river).
3. Noxious and undesirable weed control on the east side of Zone 1.
4. Connect Lake 2 and 3, and reinforce berm area.
5. Remove exposed culverts from the river.
6. Work with Colorado Division of Wildlife on river and lake enhancement programs
7. Tree planting over a three to five year period in the central portion of Zone 2.
8. Broadcast groundcover for production of duff and forage material in Zone 2.
9. Willow and natural grass plantings on erosion prone berms.
10. Barrier plantings on northwest section of Zone 2.

11. Selection of a site for river crossing.
12. Selection of a site for visitor center and temporary (seasonal) center set up on that site.
13. Begin environmental education and interpretive programs.
14. Non-motorized boating permitted in the large lake after a definite policy is established and a temporary visitor center (check-in point) is designated.

PHASE II

Phase II will be characterized by the construction of improvements and the enlargement of the primary use area from Zone 1 to Zone 1 and Zone 2. This will make available approximately 309 acres for public use. Reclamation of areas in Zone 3, following the completion of mining activities by Cooley Gravel Company, will also commence.

Priorities include:

1. Construction of a river crossing south of primary vehicle access.
2. Construction of the visitor center.
3. Development of a trail system in Zone 2.
4. Implementation of a quota system for visitor use, Zone 2.
5. Reclamation of Zone 3.
6. Continuation of Phase I programming.

PHASE III

Phase III represents the final phase of the master plan and will occur at that time when gravel mining operations have been totally completed and reclamation will be at intermediate stages. The primary use areas will be Zone 1 and Zone 3 for a total of 511 acres for moderate level use. Zone 2 (127 acres) will serve as a wildlife reservoir and should be subject to minimal, monitored use. Non-motorized boating will be designated for the large lake in Zone 3.

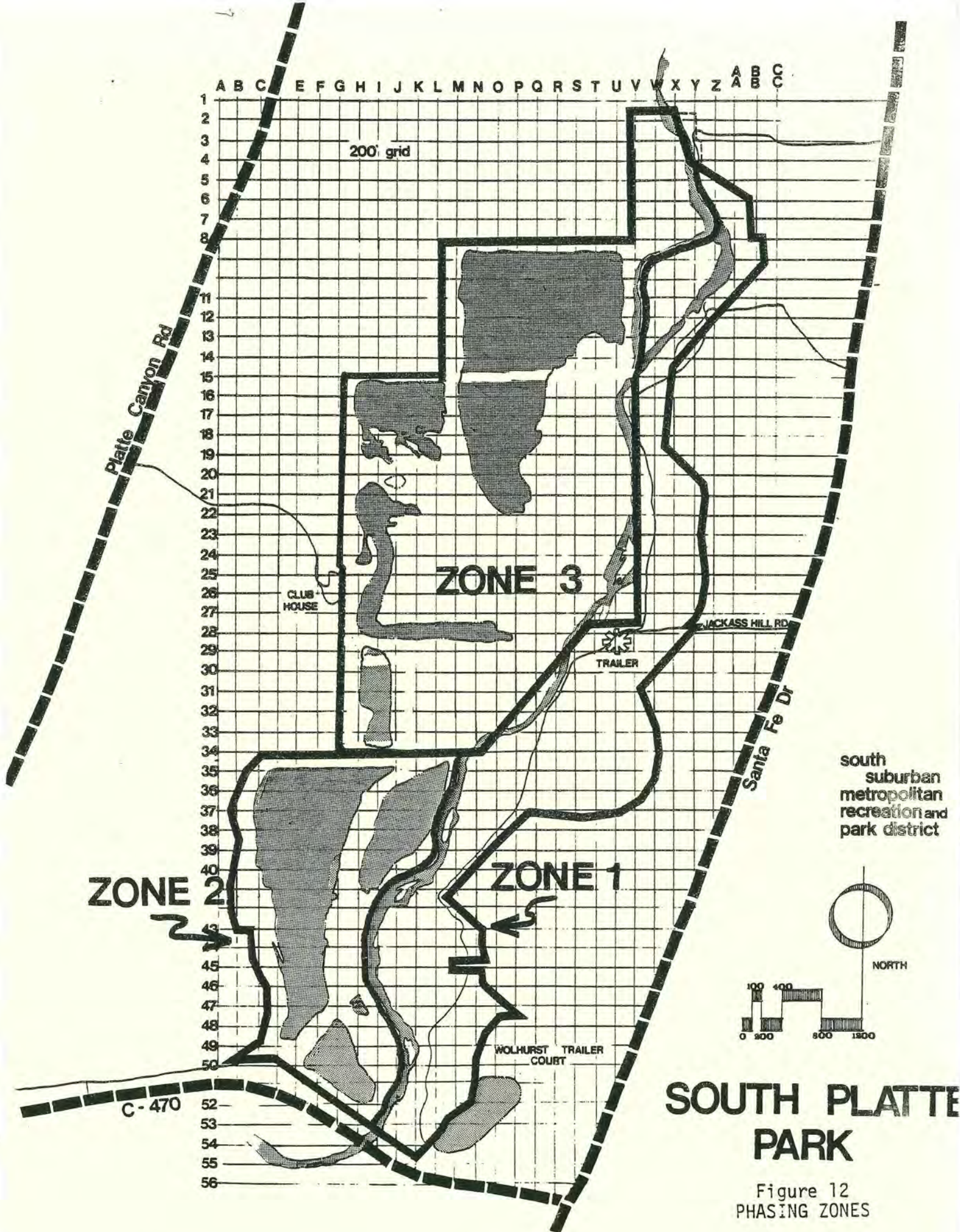


Figure 12
PHASING ZONES

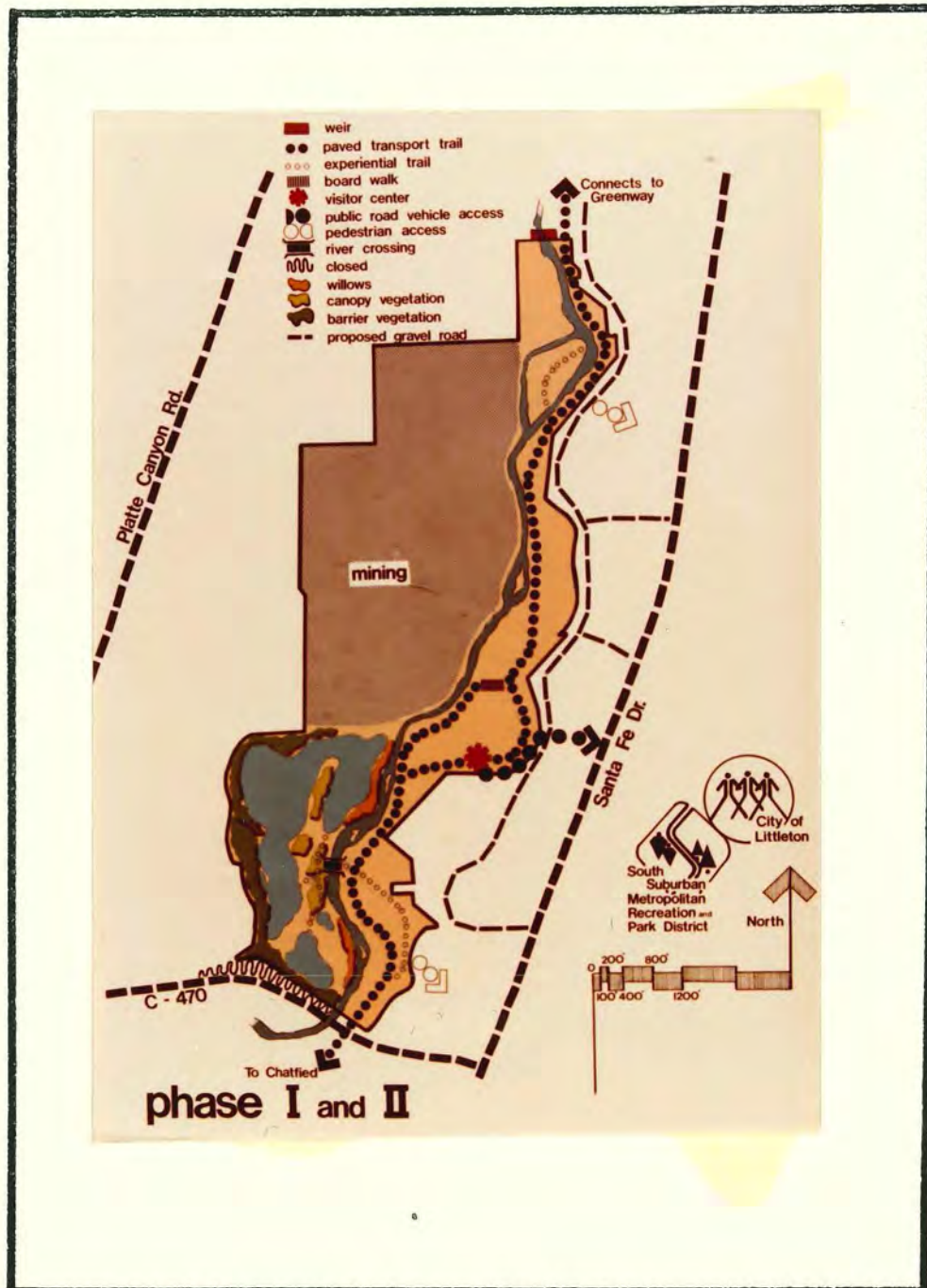


Figure 13: MAP OF PHASE I AND PHASE II OF MASTER PLAN

Master Plan One

(Figure 14)

The final phase of Master Plan One provides a two mile surfaced hike-bike trail extending the length of the park. Three narrow, less developed trails loop off the main trail to provide quiet walkways or educational experiences. Brochures, signs or tapes may be developed to aid in understanding the areas of interest.

All visitors arriving by vehicle will park in a central location next to a visitor/education center. Information will be provided on the opportunities available, on regulations, and on the interpretive programs on the park. A river crossing will be provided north of the visitor center to encourage use in the northwest portion of the park. Bank fishing and non-motorized boating (visitor provided) are anticipated to be the most popular activities in this area. It is important to note that the surface area and shore configuration on the northern lake are conceptual only. The final resource is dependent on a number of factors ranging from the final plans of the mining operation to natural changes (flooding).

The southwest section will serve as a wildlife reserve and will be available for educational experiences only and require special permits for its use.

Visitor caused impacts are inevitable and a resource monitoring program will help to determine the carrying capacity of the resource. If visitor use exceeds the park's capacity, a quota system will be implemented in the northwest section of the park. The surfaced trail on the east side of the river will provide a hardened site to support higher levels of visitor use.



Figure 14: MASTER PLAN ONE

Master Plan Two

(Figure 15)

Master Plan Two is designed to accommodate the proposed Ken Caryl Road crossing through the central portion of the park. The road will be a major barrier to both wildlife and visitor use and will essentially divide the resource into two separate parks.

Visitors arriving by vehicle will park in a central location north of the proposed road, with access provided off Santa Fe Drive or off the proposed Ken Caryl Road. This will require a different access point than is provided in Phase I and II. A visitor/education center is provided adjacent to the parking area. Park information and interpretive programs will be available at the center.

The crossing depicted in Figure 15 is conceptual only. The southern portion of the northern lake lies directly in line with the proposed crossing and has been shown as being filled for this graphic presentation. The final design of the lake crossing could range from a spanning bridge to the fill shown and the park management should have input to the final design considerations.

The proposed Ken Caryl river crossing provides pedestrian, bike trail, and wildlife corridors beneath the bridge structure, with the bike trail crossing maintaining sufficient clearance to accommodate equestrian use. The pedestrian river crossing will extend from the road crossing or lie directly north of the structure.

The primary use area will be north of the Ken Caryl crossing. Fishing and non-motorized boating are anticipated to be the most popular activities. It is important to note that the surface area and shore configuration on the northern lake are conceptual only. The final resource is dependent on a number of factors ranging from the final plans of the mining operation to natural changes (flooding). A surfaced bike/hike trail extends the length of the park on the east side of the river and requires a corridor beneath the bridge structure. Three small, less developed pedestrian trails loop off the surfaced trail to provide quiet walkways and education experiences.

The area south of Ken Caryl Road and west of the river will serve primarily as a wildlife reserve. Visitor use will be low and oriented toward educational experiences and will require special permits for its use.

Visitor impact is anticipated and will be handled in the same manner as described in Master Plan One. However, the impact of the road will present some serious concerns to the management of the area. Impacts to both visitors and the resource due to the crossing are anticipated and certain design features will be necessary in the development of the roadway.

In addition, the construction of the road is anticipated to cause several irreversible impacts. Among these are:

1. The subdivision of a unique, contiguous 600 acre natural resource.
2. The inappropriate use of land designated and managed as a federal floodplain.
3. Destruction of two wetland areas.
4. Unnatural separation of a two mile wildlife corridor and increased mortality of wildlife.

It is imperative that the District be consulted during the design phases of the proposed road to incorporate the necessary design features to maintain a safe, usable and aesthetically pleasing park resource.

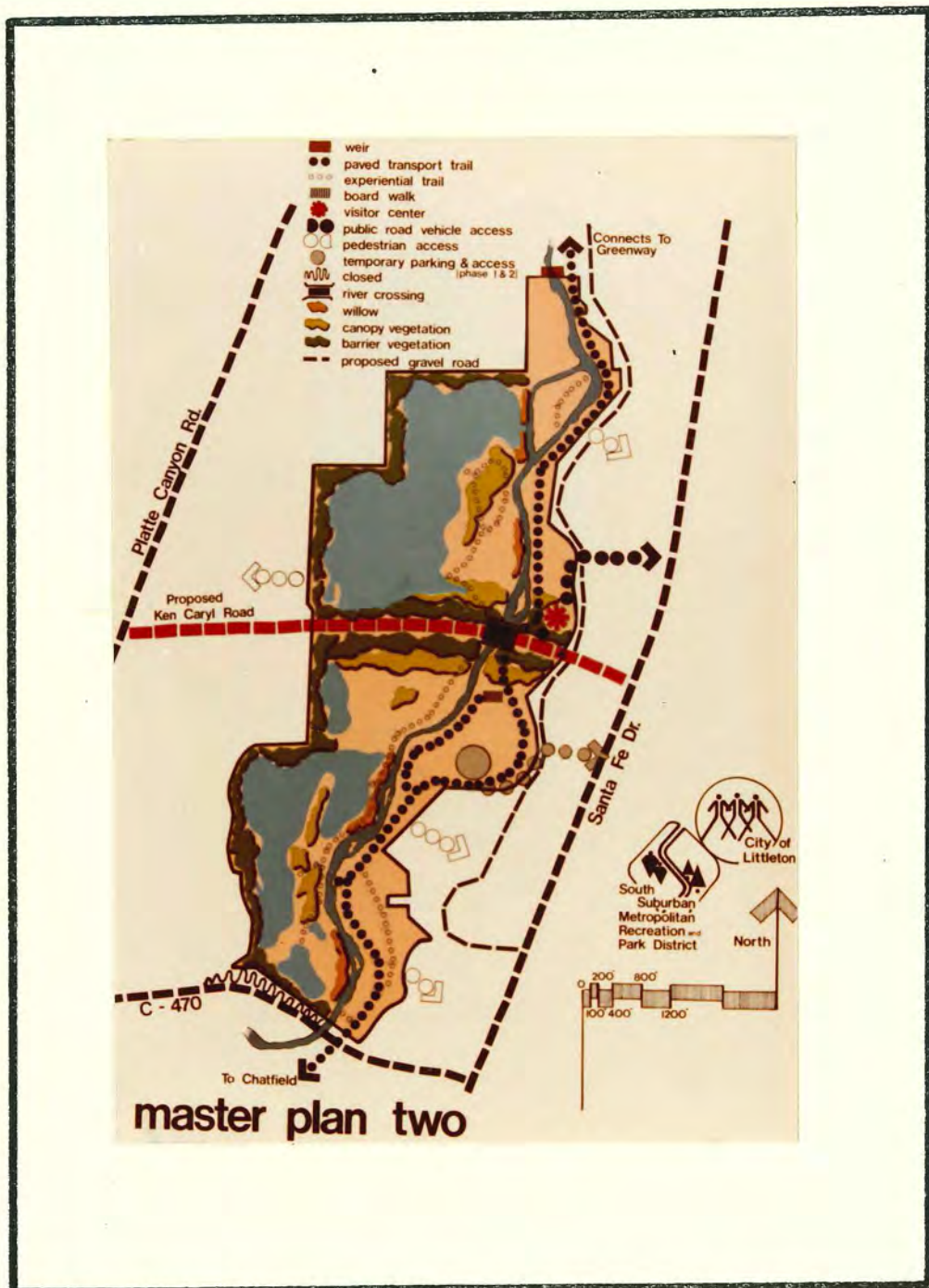


Figure 15: MASTER PLAN TWO

DEFINITION OF TERMS

Definition of Terms

Ecosystem: All biological and physical factors necessary for the continuance of life in a particular area.

Environmental Education Opportunities: Organized activities using the park resources to further educational goals, having a low impact on the resource and carried out within the constraints of park policies.

Flood: The temporary overflow of lands adjacent to a river or stream, not normally covered by water.

Floodplain: The relatively flat area or low lands adjoining the channel of the river which has been or may be covered by floodwater.

Indigenous: Being born in or living naturally in a particular environment.

Limited Leisure Opportunities: The circumstances which allow an individual to participate in the activities which suit their preferences within the regulations of the park and require minimal alteration of the resource. (e.g., A resource which supports birds and wildlife creates the opportunity for bird watching and wildlife observation but no blinds are constructed to encourage the activity in a particular area.)

"Quality" Fishing Experience: One which is characterized by aesthetic surroundings, potential solitude, and a reasonable chance of success in catching fish.

Natural: That which would have occurred without interference from man.

Park Ranger: A position that entails responsibilities, including construction of minor facilities, trail work, vegetation, wildlife monitoring, general park maintenance and public contact.

Regional Park Reserve: Area of natural quality for nature-oriented outdoor recreation, such as viewing, and studying nature, wildlife habitat, conservation, swimming, picnicking, hiking, fishing, boating, camping, and trail uses. May include active play areas. Generally, 80 percent of the land is reserved for conservation and natural resource management, with less than 20 percent used for recreation development. The area generally serves several communities within a one-hour driving time. (NRPA Park and Open Space Standards, 1983).

Restoration: To return to the condition existing prior to a disturbance.

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APPENDICES

APPENDIX I: PUBLIC NOTIFICATION

Copies of the preliminary master plan and a Notice of Public Hearing were sent to the following agencies and/or corporations.

Mr. Jack Grieb, Director
Colorado Division of Wildlife

Mr. Hamlet J. Berry, Acting Director
Colorado Division of Parks and Outdoor Recreation

Col. Phillip Weinert
U.S. Army Corps of Engineers

Col. William Andrews, District Engineer
U.S. Army Corps of Engineers

Mr. Jim Cooley
Cooley Sand and Gravel Company

A Notice of Review and Public Hearing was sent to the listed agencies, organizations and individuals.

GOVERNMENT AGENCIES CONTACTED

ARAPAHOE COUNTY:

County Commissioners
and Phil Seiber, Planning Director
5334 South Prince Street
Littleton, Colorado 80166

CITY OF BOW MAR:

Mary Carter, Mayor, and the
Board of Trustees
5201 Bow Mar Drive
Littleton, Colorado 80123

CHERRY HILLS VILLAGE:

Robert St. Clair, Mayor, and
Members of the City Council
2450 East Quincy Avenue
Englewood, Colorado 80110

COLORADO DEPARTMENT
OF HIGHWAYS:

Dick Brasher, District 6 Engineer
and Stan Palmer, C-470 Coordinator
2000 South Holly
Denver, Colorado 80222

COLORADO DIVISION
OF PARKS:

Hamlet Berry, Acting Director
and Don West, Bob Carlson,
Ralph Schell
1313 Sherman Street, Room 618
Denver, Colorado 80203

Gary Buffington, Park Manager
Chatfield Recreation Area
11500 North Roxborough Road
Littleton, Colorado 80125

COLORADO DIVISION
OF WILDLIFE:

Jack Grieb, Director, and
Robin Knox, Aquatic Habitat Specialist
and Kathy Demarest, District Wildlife
Manager
6060 Broadway
Denver, Colorado 80216

**COLORADO WATER
CONSERVATION BOARD:**

William McDonald, Director
1313 Sherman Street, Room 823
Denver, Colorado 80203

**COLORADO WATER
CONTROL COMMISSION:**

Evan D. Dildine, Technical Secretary
4210 East 11th Avenue
Denver, Colorado 80220

TOWN OF COLUMBINE VALLEY:

William H. Graham, Mayor, and the
Board of Trustees
25 Niblick Lane
Littleton, Colorado 80123

**DENVER REGIONAL COUNCIL
OF GOVERNMENTS:**

Larry Mugler, Director of Environ-
mental Services
2480 East 26th Avenue
Denver, Colorado 80211

DEPARTMENT OF THE ARMY:

Col. William Andrews, Jr., District Engineer
Jack Dover, South Platte Project Supervisor
Gerard E. Mick, Environmental Section
U.S. Army Corps of Engineers,
Omaha District Office
6014 U.S. Post Office and Court House
Omaha, Nebraska 68102

Col. Phillip Weinert
U.S. Army Corps of Engineers
105 East Vermijo Avenue, Suite 520
Colorado Springs, Colorado 80903

Jack Unitt, Park Manager
U.S. Army Corps of Engineers
9300 Colorado State Highway #75
Littleton, Colorado 80125

DOUGLAS COUNTY:

County Commissioners
and Julio Interreria, Planner
301 Wilcox Street
Castle Rock, Colorado 80104

CITY OF ENGLEWOOD:

Packy Romans, Director of Parks
3400 South Elati
Englewood, Colorado 80110

JEFFERSON COUNTY:

County Commissioners
1700 Arapahoe Street
Golden, Colorado 80141

Jefferson County Open Space
Ray Printz, Director
1801 19th Street
Golden, Colorado 80141

CITY OF SHERIDAN:

Ann Herring, Mayor, and
Members of the City Council
4400 South Federal Boulevard
Englewood, Colorado 80110

**URBAN DRAINAGE AND FLOOD
CONTROL DISTRICT:**

Ben Urbonas, Chief of
Master Planning
2580 West 26th Street
Denver, Colorado 80211

ADJACENT OR PROXIMATE LAND OWNERS, MANAGERS, PLANNERS
CONTACTED

CENCO LAND COMPANY:	Bill Grant 333 Logan Street Denver, Colorado 80203
CENTRAL CONSTRUCTION COMPANY:	Jim Superchi 6755 South Santa Fe Drive Littleton, Colorado 80120
COOLEY SAND AND GRAVEL COMPANY:	Jim Cooley and Paul Gesso P.O. Box 5485 T.A. Denver, Colorado 80217
DENVER WATER DEPARTMENT:	Bill Tolle 1600 West 12th Avenue Denver, Colorado 80254
GREEN VALLEY TURF FARM:	Ken Ensor 3100 South Sheridan Denver, Colorado 80227
JACK HERKLOTS AND ASSOCIATES :	7142 South Platte Canyon Road Littleton, Colorado 80123
KEN CARYL WATER AND SANITATION DISTRICT:	Gerald Groothuis 8340 Sangre de Christo Road Littleton, Colorado 80127
PETER KIEWIT SONS COMPANY:	7926 South Platte Canyon Road Littleton, Colorado 80123
MISSION VIEJO CO. (HIGHLANDS RANCH):	Steve Ormiston, Manager of Advanced Planning 6 Inverness Court East Englewood, Colorado 80112
NEWTON TRUST:	Homer Hancock Colorado National Bank P.O. Box 5168 T.A. Denver, Colorado 80217

WILLIAM NYE:

7460 South Platte Canyon Road
Littleton, Colorado 80123

**PLATTE RIVER GREENWAY
FOUNDATION:**

Joe Shoemaker
1421 Court Place
Denver, Colorado 80202

Bob Searns
Urban Edges, Inc.
1731 Emerson Street
Denver, Colorado 80218

PUBLIC SERVICE COMPANY:

Jack H. Muir, Right-of-Way Agent
5909 East 38th Avenue
Denver, Colorado 80220

**JAMES M. SMALL AND
ASSOCIATES:**

Gary Guinn
3615 South Tamarac Drive
Denver, Colorado 80237

**SOUTHWEST METROPOLITAN
WATER AND SANITATION
DISTRICT:**

Robert J. Flynn, Esq.
First Interstate Bank
3333 South Bannock, Suite 500
Englewood, Colorado 80110

TALLEY CORPORATION:

John Arney, Vice President
5500 East Yale Avenue
Denver, Colorado 80222

JOHN J. TODD:

7550 South Platte Canyon Road
Littleton, Colorado 80123

L. L. TUCK:

6850 South Platte Canyon Road
Littleton, Colorado 80123

**WOLHURST HOMEOWNERS
ASSOCIATION:**

Dee Holden
8201 South Santa Fe Drive
Littleton, Colorado 80123

**WOLHURST LANDING HOME-
OWNERS ASSOCIATION:**

Johnson Homes, Inc.
P.O. Box 26451
Lakewood, Colorado 80226

SPECIAL INTEREST GROUPS CONTACTED

AMERICAN HIKING ASSOCIATION:

Gundren Gaskill
Rt. 3, Box 532
Golden, Colorado 80401

COLORADO COUNCIL OF TROUT UNLIMITED:

Alexander Makkai, Vice President
2325 West 72nd Avenue
Denver, Colorado 80221

COLORADO HISTORICAL SOCIETY:

Barbara Sudler, President
1300 Broadway
Denver, Colorado 80203

COLORADO HORSEMEN'S COMMISSION:

Elinore Foley, President
1600 South Quebec Way
Denver, Colorado 80123

COLORADO OPEN SPACE COUNCIL:

John Birmingham
2239 East Colfax
Denver, Colorado 80206

COLORADO WHITEWATER ASSOCIATION:

4260 East Evans Avenue
Denver, Colorado 80222

COLORADO WILDLIFE FEDERATION:

Steven Bloneke, Executive Director
P.O. Box 18887
Denver, Colorado 80218

DENVER AUDOBON SOCIETY:

Linda Hamlin, Executive Director
1720 Race Street
Denver, Colorado 80206

Karl Roth
10260 West 18th Place
Lakewood, Colorado 80115

DENVER BASSMASTERS, INC., OF COLORADO:

David Wells, Chapter Representative
5677 South King Street
Littleton, Colorado 80123

**LITTLETON HISTORICAL
SOCIETY:**

**Bob McQuarie, Director
6028 South Gallup
Littleton, Colorado 80120**

LITTLETON SCHOOL DISTRICT:

**Jane Watson, Environmental
Education Coordinator
6558 South Acoma
Littleton, Colorado 80120**

**MOUNTAIN STATES
BICYCLE ASSOCIATION:**

**Randy McMillan
1200 Williams Street
Denver, Colorado 80218**

**SIERRA CLUB, ROCKY
MOUNTAIN CHAPTER:**

**Kirk Cunningham, Chairman
2239 East Colfax, Room 206
Denver, Colorado 80206**

**SOUTH SUBURBAN
PARK FOUNDATION:**

**6315 South University
Littleton, Colorado 80121**

**UNITED SPORTSMEN'S
COUNCIL:**

**Larry Strohl, President
5800 East Jewell Avenue
Denver, Colorado 80224**

INTERESTED CITIZENS CONTACTED

Ann Carney
9295 Ciacio
Thornton, Colorado 80229

Jerry Druen
5562 East Caley Avenue
Littleton, Colorado 80121

Vince Graczyk
7575 East Arkansas, #8-203
Denver, Colorado 80231

David H. Hawk
6331 South Florence Way
Englewood, Colorado 80111

Jack Merdock
2694 South Grant
Denver, Colorado 80210

Ted McShane
6914 South Dahlia
Littleton, Colorado 80122

Mike Pettit
705 East Drake, #39
Fort Collins, Colorado 80525

Jim Voight
6000 Dahlia Street
P.O. Box 5188
Denver, Colorado 80217

Martha Wetsel
232 Pearl Street
Denver, Colorado 80203

The following Notice of Public Hearing was published in the Littleton Independent on March 23, 1983.

NOTICE OF PUBLIC HEARING

A public hearing for the preliminary master plan for South Platte Park will be held at 7:30 p.m., Wednesday, March 30, at the Littleton Center, 2255 West Berry Avenue, Littleton, Colorado, in a joint meeting of the Littleton City Council and the South Suburban Board of Directors.

Copies of the preliminary master plan are available for your review at the following locations:

Littleton-Bemis Public Library (reserve)
6014 South Datura

John V. Christensen Library (reserve)
2305 East Arapahoe Road

Arapahoe County, Sheridan Branch Library
(reserve)
3201 West Oxford Avenue

South Suburban Metropolitan Recreation
and Park District Administration Office
6315 South University Boulevard

City of Littleton
Littleton Center
2255 West Berry Avenue

For further information, contact Mrs. Mary
Weber-Quinn at 795-6531.

Grant Goodson
Chairman

SOUTH SUBURBAN METROPOLITAN
RECREATION AND PARK DISTRICT

James P. Collins
Mayor

CITY OF LITTLETON

Published March 23, 1983

Published in The Independent

The following press release was issued to the Littleton Independent,
Rocky Mountain News, and the Denver Post.



**south
suburban
metropolitan
recreation and
park district**

6315 South University Boulevard
Littleton, Colorado 80121 • 798-2493

BOARD OF DIRECTORS

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PRESS RELEASE, 3-21-83

Mary Weber-Quinn, Platte Park Manager

A public hearing for the preliminary master plan for South Platte Park will be held at 7:30 p.m., Wednesday, March 30 at the Littleton Center, 2255 W. Berry Ave., Littleton, Colorado in a joint meeting of the Littleton City Council and the South Suburban Board of Directors. South Platte Park is a 640 acre floodplain area in southwest Littleton and contains several lakes in addition to approximately 2 miles of the South Platte River.

Copies of the preliminary master plan are available for public review at the following locations:

Littleton-Bemis Public Library (reserve)
6014 S. Datura

John V. Christensen Library (reserve)
2305 E. Arapahoe Rd.

Arapahoe County, Sheridan Branch Library (reserve)
3201 W. Oxford Ave.

South Suburban Metropolitan Recreation and Park District
Administrative Office
6315 S. University Blvd.

City of Littleton
Littleton Center
2255 W. Berry Ave.

For further information, contact Mrs. Mary Weber-Quinn at 795-6531.

APPENDIX II: PUBLIC COMMENT

BETTENBERG, MILLER, MAKKAJ & DOWDLE

ATTORNEYS AND COUNSELORS AT LAW

ROBERT T. BETTENBERG
DENNIS M. MILLER
ALEXANDER J. MAKKAJ, JR.
PATRICK D. DOWDLE
CHARLES E. STRIMAN

2325 WEST 72ND AVENUE
DENVER, COLORADO 80221
(303) 427-7584
(303) 428-7460

September 17, 1982

Mr. Vince Graczyk
South Suburban Recreation District
6315 South University Boulevard
Littleton, Colorado 80121

Re: Littleton Flood Plain Stream Improvement Project

Dear Mr. Graczyk:

As you know from our past discussions, I am currently serving as Vice President of the Colorado State Council of Trout Unlimited, and I am actively engaged in the activities of the Cutthroat Chapter of Trout Unlimited which is generally located in the Littleton/Englewood area. As you also know, the Cutthroat Chapter of Trout Unlimited, Cooley Sand and Gravel Company and the Division of Wildlife of the State of Colorado are undertaking a stream improvement project in the South Platte River which is located in the Littleton Flood Plain Park. It is my understanding that South Suburban will be responsible for the implementation and enforcement of regulations with regard to this particular area. Therefore, this correspondence is to inform you of the position of the Cutthroat Chapter and the Colorado Council of Trout Unlimited with regard to various matters pertaining to the Littleton Flood Plain Park.

Inasmuch as I also serve as the project coordinator with regard to the stream improvement project to be performed in the South Platte River in the Littleton Flood Plain Park, I have been able to work with Mr. Paul Gesso of Cooley Sand and Gravel relative to the actual work to be performed concerning this stream improvement project. The project itself will basically consist of the placement of random rock, three feet to five feet in diameter, in the streambed of the South Platte River in the proposed park. While this type of stream improvement is generally called "random rock placement" there is really nothing random about such placement. I have previously forwarded to you a rough design of the random rock placement that is being contemplated with regard to this project. The placement of the boulders is determined by certain configurations which are produced by placement of a series of rocks and the effect of that placement upon the stream flow. The basic intent of the rock placement is to provide sufficient cover for the fish, mostly trout, which currently exist in the area in question. Additionally, it is the intent to provide additional and more extensive cover by the placement of the aforementioned rock in order to increase the fish population of the South Platte River as it flows through Littleton Park. Hopefully, once the project is completed the river in the area of concern will be able to support a significantly larger number of trout than it does at the current time. With regard to the schedule and the proposed completion of the

Mr. Vince Graczyk
September 17, 1982
Page Two

project, the actual work will commence sometime in the fall of 1982. It is anticipated that work will be commenced in the river either in late October or early November. It will be necessary to commence and complete the initial placement of rock during the winter months inasmuch as that is the only time that the flows in the river are sufficiently low in order to allow access to the streambed itself. The equipment, which consists of a front-end loader owned by Cooley Sand and Gravel, is of such character that it would be necessary to allow the streambed to "dry out" to a certain degree in order to avoid having the rather heavy equipment to become stuck in the streambed. Additionally, the main concern of the Stream Improvement Project with the placement of random rock in the streambed would be to guarantee sufficient cover specifically during low flow periods for the trout which will reside in the area. In any event, it would appear as though the initial rock placement upon the project could be completed within four to six weeks from the date of commencement. Once that rock has been in place for a period of time, it may be necessary to place additional rock or relocate some boulders in order to "fine tune" the rock placements in order to achieve the desired results. This will be determined in the Spring of 1983 when the flows increase. It is at that time that a determination will be able to be made as to the effectiveness of the rock placement. This is particularly true in view of the large fluctuations in flow in the river as the result of the activities of the Army Corp of Engineers at Chatfield Reservoir.

Another important factor that should be considered once the project is completed by the Spring of 1983 is the type of regulations to be placed upon the river as it flows through Littleton Park. Obviously, at the present time it is impossible to make a determination as to the effect upon the fishery achieved through the project. Therefore, in order to determine the success of the project, some data will have to be obtained from the river relative to the number of fish which will be residing in the river effected by the project. Therefore, it is the position of Trout Unlimited that once the project is completed, that the area be closed to fishing for a short period of time in order to determine what effects if any the project has upon the resident fish in the river. This can be accomplished through visual observation or by an electroshocking of the river and a sampling thereof. Once an initial determination is made, future discussion may be held with regard to the issue of stocking the area in which the project has been completed. However, it should be noted that the stocking of hatchery-bred trout generally has an adverse impact upon the resident wild trout currently residing in any given piece of water. This would be particularly true in such a fragile fishery as the South Platte in the Littleton Park, at least in its early stages.

As a result of the foregoing, Trout Unlimited is also of the opinion that it would be best for the fishery to limit any fishing in the Littleton Flood Plain Park to catch and release, at least for a period of time necessary to accumulate data with regard to the nature of the fishery. As you know, this would necessitate that all fish being caught be returned to the water immediately. In order to facilitate such catch and release regulations, the fishing in the park should be limited to flys and single-hook lures only.

Mr. Vince Graczyk
September 17, 1982
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This would be necessary in order to insure that those trout which are returned to the water have a substantial opportunity to survive. Various information and data accumulated throughout the State of Colorado and other Rocky Mountain States indicate that there is substantially less mortality upon fish by the use of flys and single-hook lures than there is with bait.

In conclusion, it is the position of the Cutthroat Chapter of Trout Unlimited and the State Council of Trout Unlimited that once the Littleton Stream Improvement Project has been completed, the area be closed to fishing for a short period of time, possibly a few months. Thereafter, once fishing is allowed in the area, it is suggested that such fishing be with flys and single-hook lures only and that no bait would be allowed. Also, it is suggested that, due to the fragile nature of the fishery, at least initially, that all fish caught be immediately returned to the river. Once sufficient data has been obtained with regard to the fishery, subsequent decisions may be made with regard to possibly stocking the river and possibly allowing some very limited taking of fish from the area.

Should you wish further information with regard to Trout Unlimited's involvement in this project, please contact me at your convenience.

Very truly yours,


Alexander J. Makka, Jr.

AJM:dp



Denver Bassmasters OF COLORADO
CHAPTER 812 *Bass Anglers Sportsman Society*®
OF AMERICA

October 5, 1982

Mr. Vince Graczyk
South Suburban Recreation & Park District
6315 South University Blvd.
Littleton, Colorado 80121

Dear Mr. Graczyk:

Thank you for the opportunity to address the warm water fish program in South Platte Park. My involvement with the Bassmasters and the United Sportsmen's Council has provided me with some very special privileges. This however, has to be one of the most rewarding. Since the inception of this park, some ten years ago, I have often wondered what the management concept would look like. At this point I feel as if you and your people at SSRPD are doing an outstanding job.

Developing the park and maintaining it as a natural area has always been an admirable goal. I must admit that having it become a multiple use area, rather than one where people can observe and enjoy nature in it's natural environment, is a possibility that has often bothered me. This type of park is not commonly located so close to a large metropolitan area such as we have. It may very well be the first of it's kind in the state.

In order to maintain this type of pleasurable diversion we must establish some rather restrictive rules and regulations. Restrictive in the aquatic sense that is, as most parks are already managed to protect the wildlife such as birds, animals and vegetation. But few if any, aside from some of our National Parks, provide adequate protection for the aquatic species.

As you are aware of the Division of Wildlife has now established a separate Metro Sportfish program in addition to the Warm Water Sportfish program. These programs will be made public with the introduction of the 1983 five year strategic plan. This plan is an overview of what the Wildlife Commission has directed the Division to accomplish over the next five years. You probably observed when you reviewed the final draft of these programs, that one of the top priorities was to:

ESTABLISH REGULATIONS TO INCREASE ANGLING SUCCESS AND SIZE OF FISH CAUGHT.

While this may not appear to be a very powerful objective, let me assure you that it is. Most importantly it reflects the attitude change toward warm water fish by both the Wildlife Commission and the Division. Although advancement is being made in warm water fish management, we're still playing catch-up here in Colorado. This is primarily due to the fact that Colorado has always been thought of as a trout state with very little attention being given to our warm water potential. People are now beginning to realize

Mr. Vince Graczyk
October 5, 1982
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that most of the waters along the front range are very suitable to warm water fish production. Establishing regulations to increase angling success and size of fish caught is important for a number of reasons. One is that warm water fish such as bass, have the ability to reproduce in our small impoundments, trout do not. This ability, when coupled with the proper regulation, all but eliminates the need for stocking of expensive hatchery raised fish. Increasing the size of fish caught is usually achieved by allowing them to grow. This also permits them to reach maturity whereby they reproduce, increasing population and angling success.

I would like to present the following suggestions and justifications for your consideration in establishing regulations in South Platte Park.

I. ALL FISHING BE FOR SPORTFISHING ONLY WITH ALL FISH CAUGHT BEING RETURNED TO THE WATER IMMEDIATELY.

This regulation allows an individual fish to provide recreation for more than one person...one time. This practice is employed at the Rocky Mountain Arsenal, where sportfishing is provided on a special permit basis and is very successful. We feel that the days of catching fish for the table are just about over. Not because we don't have as many fish, but because of our continued population growth. Fishing is becoming a more popular sport with more sophisticated equipment and literally volumes of information available to improve your skill.

Catch-and-Release fishing is also much easier to administer from a law enforcement position. Since possession of any fish is a violation there is no reason for an enforcement officer to know the daily bag and possession limit for the different species. (ie; Bluegill,30; Crappie,20; Channel Catfish, 10; Bass,6) It also eliminates the rather touchy situation that can arise over whether a fish is of legal length. (ie; 15" minimum at Chatfield) This regulation also makes it feasible for any law enforcement officer to enforce the law, whether they can differentiate fish species or not.

II. ONLY FLYS OR ARTIFICIAL LURES MAY BE USED. NO LIVE BAIT, PROCESSED BAIT (CANNED MINNOWS, ETC.) OR SALMON EGGS.

This regulation has two important benefits. The first and most important (from a biological standpoint) is that fish do not ingest artificial baits as deeply into the esophagus as they do live bait. This is primarily due to the fact that artificials are usually kept moving. This enables the angler to detect the bite immediately thereby preventing the fish from swallowing the bait.

The other benefit of not allowing live bait is the reduction of litter. There are no salmon egg bottles discarded along the shore. No styrofoam worm containers or snelled hook packages, which seem to be around forever. And since anglers using artificials seem to be more mobile there is a lack of soft drink containers and those damn plastic rings to snare wildlife.

Mr. Vince Graczyk
October 5, 1982
Page 3

III. USE OF BELLY BOATS OR OTHER NON POWERED BOATS
BE PERMITTED FOR FISHING

The City of Wheat Ridge now permits the use of belly boats on West and North Prospect Lakes. All air inflatable boats must be of multiple chamber construction and be approved by the park ranger. Upon approval you are issued a Wheat Ridge Parks boat sticker to be affixed to the vessel. A current Coast Guard approved life jacket must be on board for each occupant of any boat.

People who are unfamiliar with belly boats usually foresee problems with their use. One is that there will be an increase in problems with youngsters using plain innertubes or rafts. These devices are no more permissible with the authorization of approved belly boats than they were in the past. If swimming and/or tubing are not permitted, then that's the rule. A person using an approved belly boat to enhance their fishing experience does nothing to encourage the violation of a park rule.

Another concern is that boat anglers will interfere with bank anglers. Boat anglers are always supposed to be considerate of bank anglers and we feel that our experiences find this to be true. People have a way of co-existing in most situations such as this.

Thank you again for the opportunity to address this program. I hope that these suggested regulations will assist your organization in providing fishing that is compatible with the basic purpose of the park; preserving natural environments and providing the opportunity for visitors to see and appreciate native plant and animal life as it occurred in a more primitive time.

If I can be of further service to you please feel free to contact me at any time.

Sincerely,

DWells

Dave Wells
5677 South King Street
Littleton, CO 80123

794-6995 Home
344-1883 Office

STATE OF COLORADO
Richard D. Lamm, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE

Jack R. Grieb, Director
6060 Broadway
Denver, Colorado 80216 (825-1192)



February 23, 1983

Mary Weber
Park Mgr, South Platte Park
South Suburban Rec District
6315 South University
Littleton, CO 80121

Dear Mary:

After reviewing your management proposal for South Platte Park, I would like to make the following comments:

I wholeheartedly support your plans for :

1. Vegetation Islands around the existing lakes.
2. Connecting the two lakes.
3. Maintaining existing natural vegetation for both people management and wildlife management.

The maintenance of the flood plain and its vegetation should lead to maximization of the area's habitat potential. As time goes on, the vegetation should be evaluated for its continuing wildlife value, with possible changes recommended then.

One thing I would like to recommend is deletion of the islands planned in some of the lakes. Waterfowl, particularly goose, nesting habitat is not needed anywhere in the Northeast part of Colorado. Our current waterfowl management plan specifically identifies elimination of artificial nesting habitat as a management strategy. Since we have been removing goslings from this property in past years as part of our population reduction program we would welcome this change in your plan.

The educational possibilities for the park are unlimited and we support your efforts. We will be happy to help you with planning these programs and providing what technical advice we can. I would also recommend establishment of a permanent wildlife sighting-mapping system for the park, and the system currently being started at Chatfield would be applicable for you also.

As far as fishery development plans are concerned, the undulating shoreline development you have scheduled in the first phase would be beneficial both to the fishery and in visitor management. I have recently met with Phil Goebel and discussed habitat structure placement to be done within the next 2-5 years. Fishery and water quality monitoring will also continue within our normal metro sampling rotation (approximately bi-yearly).

In response to your questions about deer fencing and animal-vehicle problems, to my knowledge the problem is minimal, and primarily on the northern and southern ends of the park. Unless Littleton Police Department has responded to calls we don't know about, it has been my experience that there are 2-5 deer in the street problems per year around Bowles and the Platte. A little patience on the part of the motorists usually allows the deer to cross the street without major problems. Since we have found that we usually hurt more animals and/or cause more damage by "herding" or tranquilizing, we prefer this solution when animals do get out on the street. On the South end, there is a moderate use crossing at Highway 470 and the Platte. 2-8 deer per year are killed in this spot. We do not have a road kill or crossing problem that I know of on either Santa Fe or South Platte Canyon as they parallel the park. For these reasons, I told you previously that I didn't feel deer fencing was cost effective in this situation. However, for your information, I have obtained current deer fencing costs from our regional staff. Contractor installed standard 8 foot high woven wire deer proof fencing with wooden posts every 10 feet is running between \$3.00 and \$3.50 per foot (\$15,480 - \$18,480 per mile). Even if Ken Caryl is extended through the park, I do not think deer in the street problems would increase enough to justify this level of expense. However, shrub plantings of close growing, non-forage species might help prevent problems at a much more affordable cost. Since G-470 will not be deer fenced any further east than its junction with Deer Creek Canyon the south deer crossing will remain and fencing your side of the road without fencing the other side wouldn't be very helpful.

As far as beaver management within the park is concerned, I think some beaver can be maintained without causing problems. I would recommend maintaining 2 colonies of stable population. This means some trapping would have to be done to prevent establishing additional colonies when young are dispersed from present colonies. The Division is not currently using live trapping to manage beaver in the metropolitan area due to lack of unoccupied transplant sites.

In summary, I am very pleased with the overall management proposal. I do not think there any unsolvable problems. I have enjoyed working with you on the wildlife sections, and hope you will continue to solicit our comments and help.

Sincerely,

Kathi Demarest

Kathi Demarest
District Wildlife Manager
Denver, SW

cc:Young

Southwest Metropolitan Water and Sanitation District

District Maintenance Office:
7677 Ken Caryl Road
Littleton, Colorado 80123
979-2333

March 25, 1983

Mr. Grant Goodson
Chairman
South Suburban Metropolitan
Recreation and Park District
6315 S. University
Littleton, Colorado 80121

Re: South Platte Park

Dear Mr. Goodson,

As manager of the Southwest Metropolitan Water and Sanitation District I have had occasion to review the master plan for the South Platte Park. I am very impressed with the amount and depth of planning accomplished to date, and congratulate the City of Littleton and the South Suburban Metropolitan Recreation and Park District on their extensive effort.

I appreciate this opportunity to express Southwest Metropolitan's concerns relative to the park master plan. One deficiency noted in the master plan is the lack of explanation concerning access to and along existing easements. The report points out the fact that Southwest Metropolitan owns, operates and maintains a major sanitary sewer interceptor through portions of the park. This sewer main transports sewage from an excess of 7,000 residences within the City of Littleton, Southwest Metropolitan Water and Sanitation District, Ken Caryl Ranch Water and Sanitation District, and Meadowbrook-Fairview Metropolitan District. In order to ensure trouble-free operation of this important facility, the District requires continual access to all points along the interceptor.

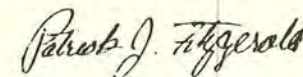
The District proposes that this issue be addressed more thoroughly during phase I of the project. We respectfully request that consideration be given to aligning the trail system and/or the planned gravel road in order to provide crucial access to the utilities traversing the park property.

The master plan makes reference to Southwest Metropolitan's proposal to construct a parallel sewer line adjacent to the existing 36 and 48 inch pipe. This additional capacity will benefit several entities including the City of Littleton. The report requests that the proposed sewer main be located outside of the park boundaries. The District would be pleased to honor this request and work with South Suburban to mitigate the impact of sewer construction within or without the park. However, it must be realized that there may be areas where the technical feasibility and/or cost effectiveness of the sewer project would be enhanced by construction within the park boundaries.

Again, the District appreciates this opportunity to provide comments relative to the farsighted, thoughtful park proposal, and we look forward to working with you as the development of the plan is realized.

I would be pleased to discuss any of the above issues with your representatives at their convenience.

Yours sincerely,



Patrick J. Fitzgerald
District Manager

PJF/dc

cc: Mrs. Mary Weber-Quinn
Mr. Ira Hardin
Mr. Robert Flynn
Mr. Gordon Meurer



U. S. 285 & Colorado 8
P. O. Box 5485
Denver, Colorado 80217
(303) 897-1401

March 30, 1983

Mary Weber-Quinn
South Suburban Park & Recreation Dist.
6315 South University Blvd.
Littleton, CO 80121

Dear Ms. Weber-Quinn:

I am writing in regard to the preliminary Master Plan for the South Platte Park. I will not be able to attend the March 30 public hearing, so I therefore request you read our comments into the record.

1. The name of our Company on page 17 is Cooley Gravel Company, not Cooley Sand and Gravel Company.
2. Page 55, concerning Platte River Improvements - I have been able to get the Colorado Rock Products Association to back this project in conjunction with Trout Unlimited. The project as designed by Trout Unlimited members was too extensive for one company to handle. We are now proceeding to line up the necessary equipment to get the job done. I will keep you apprised of the progress.
3. Page 93, Reclamation Techniques - Cooley Gravel Company will cooperate in changing future plantings if it is found that species we are currently using are undesirable.
4. Proposed East West Power Line - As you know, we have a lease to mine the property to the south of the Grant Bench owned by the Nyes. Public Service has expressed an interest in the R.O.W. but have not approached us with definitive plans. We, of course, will be interested in protecting our leaseholding and will work with you and Public Service when they approach us.

5. Phase I and II Development Plans and Cooley's access to the Grant Bench - the agreed to haul road from the Bench property is not mentioned during phases I and II. Also, potential access to the Nye parcel south of the Bench. I believe this should at least be recognized during your phasing because of potential conflicts between Park Users and the Mining Operations.
6. Site Safety - During Phases I and II there exists a tremendous problem concerning site safety. We are already experiencing 4 wheel drives, dirt bikes, and other forms of trespass in the mining area. We have also experienced damage to equipment. I don't know if this plan is the appropriate place to address this, but suggest a meeting between Cooley, The City, and South Suburban to formulate reasonable site safety plans to protect the public and all other entities involved. I suggest this be done as soon as possible.
7. Alternatives Plan I versus Plan II - In looking at the graphics on pps 110 and 113 and comparing the two, Master Plan One represents the configuration of the lakes as Cooley will leave them. Master Plan Two is not close to our permitted mining plans. I feel that Master Plan Two is unrealistic unless a great amount of money is found to backfill the lake and stabilize it to accomodate a road. Several alternatives would be to build a causeway at great expense or move the road alignment further south which would greatly impact usable park space.

I am not expressing an opinion on the Ken Caryl Road Crossing but merely trying to point out what is realistic and what is not. This subject came up during our annexation and rezoning hearings and at that time I told the City Council the area would be mined. Given these facts, I believe Master Plan One to be the most realistic approach until someone solves the construction problems associated with Master Plan Two.

I hope these comments are helpful. You have done a very good job on the park plan. If I can be of any further assistance, please feel free to call.

Sincerely,

Paul G. Gesso
Resource Manager

PGG:dc



STATE OF COLORADO

Division of Parks & Outdoor Recreation

1313 Sherman Street, Rm. 618
Denver, Colorado 80203
Phone (303) 839-3437



Richard D. Lamm,
Governor
D. Monte Pascoe,
Executive Director
George I. O'Malley, Jr.,
Director
Colorado Board of Parks
and Outdoor Recreation
Richard G. Bridleman,
Chairman
Phil Eggleston,
Vice Chairman
Hubert A. Farber, Jr.,
Secretary
Teresa I. Taylor,
Member
Richard S. Bartlett,
Member

April 11, 1983

Mrs. Mary Weber-Quinn
South Suburban Metropolitan Recreation
and Park District
6315 South University Boulevard
Littleton, Colorado 80121

Dear Mrs. Quinn:

The Division of Parks and Outdoor Recreation has reviewed the South Platte River Preliminary Master Plan for consistency with the State Comprehensive Outdoor Recreation Plan (SCORP) and its relationship to Chatfield State Recreation Area.

In general, the Division agrees with the conclusions and recommendations contained in the preliminary plan. We would like to offer the following comments and observations for your consideration in developing the final plan.

Relationship to Chatfield State Recreation Area

Both master plan alternatives identify trail access to Chatfield SRA on the east side of the South Platte river. The specific design for the point of access must be coordinated with this Division, State Highway Department, U.S. Army Corps of Engineers, South Suburban MR&PD, and the City of Littleton to ensure safety and the best possible design and management alternatives. Please feel free to contact us when your plans have progressed to a more site specific stage.

Historically, the South Platte Park has been used by gaining access from C-470 on the south end. There are obvious safety and management problems associated with accessing the park from an undesignated point along a state highway. This situation needs to be rectified as soon as possible, as you have indicated in the Plan, before historic use causes even greater problems and possibly precludes a more viable alternative.

A permit quota or fee system was mentioned in the Plan to control capacity of specific areas. As you know, this is a very management-intensive objective. The Division has a considerable amount of experience in this area and we would be happy to discuss our successes and failures with you. We will also be very interested in seeing how this type of system works out for you.

Mrs. Mary Weber-Quinn
April 11, 1983
Page two

The visitation to Chatfield SRA has increased by approximately 600,000 visitors over the past five years, an increase of about 125 percent. As stated in the Plan, Chatfield SRA has reached capacity on weekends and holidays on many occasions. We expect this capacity situation to continue, if not increase, in the future. Even though the management objectives for the South Platte Park are somewhat different from Chatfield's SRA's, and the Plan proposes to limit visitation through permits, quotas, and locating the park's entrance in a somewhat obscure place, we feel that you can expect the visitation pressure at South Platte Park to be very intense.

State Comprehensive Outdoor Recreation Plan

The South Platte Park will help satisfy several high priority need activities identified in the SCORP for State Planning Region 3, most particularly: picnicking, bicycling, hiking, and fishing. It will also provide a high priority open space and natural area in the southern part of the Denver Metropolitan Area.

Trail access to and through the South Platte Park will also provide a high priority link in the State Recreational Trails Plan. This particular link, from Littleton to Chatfield SRA, has long been identified as a critical link in the South Platte River trail.

Thank you for the opportunity to review and comment on the South Platte Park Preliminary Master Plan. We found the Plan to be well researched and prepared, and presented in a very straight-forward manner. Obviously, a significant amount of time and effort has gone into making the Plan successful.

If you should have any questions regarding our comments, please feel free to contact us.

Sincerely,

Rich Ferdinandsen
for H. J. "Chips" Barry
Acting Director

HJB:RS:nb
cc: Rich Ferdinandsen
Max Vezzani



April 12, 1983

Ms. Mary Weber
South Suburban Metropolitan
Recreation and Park District
6315 South University Boulevard
Littleton, CO 80121

Dear Ms. Weber:

SUBJECT: Preliminary Master Plan, South Platte Park

The Colorado Division of Wildlife has reviewed the South Platte Park Preliminary Master Plan and has a few comments and recommendations to make regarding the document. First, however, we would like to express our appreciation for the opportunity to work with the City of Littleton and South Suburban Metropolitan Recreation and Park District in the development of this park and to commend the City and the District for their efforts to preserve this valuable section of the urban South Platte River.

Riparian ecosystems constitute approximately 2 percent of all habitat types in Colorado, yet provide the most productive and species-diverse habitat we have. With increasing statewide development pressures, the abundance of these areas is declining so it is particularly noteworthy that this park will preserve several hundred acres of the riparian resource in the heart of the Littleton metropolitan area.

Our comments regarding this document focus on several areas: aquatic resources and fisheries biology, wildlife resources, and law enforcement concerns:

AQUATIC RESOURCES SECTION

Water Quality

This section should mention the stream rating that was given to this section of the South Platte during the Water Quality Control Commission's hearings, i.e., cold-water Class I, which is the highest rating possible in terms of aquatic biota and recreational uses.

Also, water quality information for the South Platte River exists which could be considered for inclusion in a table.

Ms. Mary Weber
Page 2
April 12, 1983

FISHERIES BIOLOGY SECTION

This section could use more detail. It is suggested that it be divided into two sections:

1. Riverine Habitat and Ecology.
2. Lake (lacustrine) Habitat and Ecology.

Each section would have several sub-sections that deal with:

- a. Preconstruction Habitat Description in greater detail than presented.
- b. Preproject inventories of fish population.
- c. Project potential in terms of species management.
- d. Potential Habitat manipulations.
- e. Potential population manipulation.
- f. Recommended methods for control of angling pressure, i.e., angling or use regulations.

It would be better to address each type of aquatic system completely under a section heading so that a good feel for the potential uses of the aquatic systems could be realized. The plan's present structure causes the reader to switch back and forth from river to lake and a broad picture of the present condition compared with the future potential is difficult to grasp.

Under "Preliminary Stocking Recommendations," I think it would be better to avoid mentioning any specific species at this time, and refer perhaps to coldwater, coolwater, or warmwater fish community structure developed through a stocking program. Warmwater fisheries appears to be the best management proposal for these ponds. River improvements adjacent to the park will provide more appropriate coldwater (trout) habitat.

The park will have an excellent potential to support a variety of aquatic animal communities; this potential is perhaps slightly underplayed in the Preliminary Master Plan, but as the development of the park continues, we look forward to assisting with the recognition and management of these opportunities.

WILDLIFE RESOURCES SECTION

Since riparian habitat areas are such an important ecosystem in Colorado, perhaps "managing the park to provide for the maintenance and regeneration of the riparian ecosystem" should be included as a specific objective under Goal No. 2, to provide additional emphasis.

Habitat enhancement for ring-necked pheasant, ducks and geese, and deer is included in the comprehensive management plan for wildlife as an objective in the northeast region of the state but is probably not an appropriate objective for the South Platte Park. It would be more appropriate to emphasize management of the park for nongame wildlife species, particularly

Ms. Mary Weber
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April 12, 1983

since hunting will not be encouraged in the park. The Division of Wildlife will be happy to make the latilong information for this area available to the District as an aid to determining what wildlife species could probably be expected to occur. This may require some revisions of the resource management recommendations in the document.

Great blue herons, in particular, may be one species which will become well established in the area if sufficient roosting trees are available. If they begin nesting, the Division would be available to assist the District in developing protective measures.

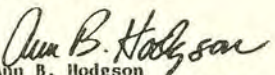
The environmental education opportunities at the park will be diverse. Perhaps a cadre of trained teacher-naturalists would be one way to provide adequate environmental interpretation. The interpretive trail for the blind is an excellent suggestion.

LAW ENFORCEMENT CONCERNS

Law enforcement at the park will probably focus on fishing regulation. Education of the public will be the key to enforcing whatever fishing regulations are adopted for this area. Coordination between the District and the Division of Wildlife will ensure that appropriate fishing regulations to meet the District's goals are adopted for the park. The Division's District Wildlife Managers for this area will assist the District with enforcement, but due to their multiple responsibilities, the DWMs are limited in the amount of time they can spend in any one area.

Thank you again for the opportunity to comment on this Preliminary Master Plan. We look forward to continuing to coordinate with the City of Littleton and the District in the development of the South Platte Park. If you have any questions regarding these comments, please don't hesitate to call me.

Very truly yours,


Ann B. Hodgson
Wildlife Program Specialist

ag

cc: K. Demarest
W. Gaul
P. Gooble
R. Knox
S. Werner

SOUTH SUBURBAN METROPOLITAN RECREATION AND PARK DISTRICT

(Special Meeting of the Board)

and

CITY OF LITTLETON

JOINT PUBLIC HEARING
ON THE
MASTER PLAN OF THE
SOUTH PLATTE PARK

A special meeting of the Board of Directors of South Suburban Metropolitan Recreation and Park District, meeting in joint session with members of the Littleton City Council, was called to order by Mr. Grant Goodson, chairman, on Wednesday, March 30, 1983, at 7:30 p.m., at the City Center, 2255 West Berry Avenue, Littleton, Colorado.

Those in attendance:

- Mr. Goodson
- Mr. Moorhead
- Dr. Milliken
- Mrs. Hegglund
- Mr. Castleberry, Executive Director
- Mrs. Bay, Administrative Assistant

Mr. Goodson welcomed those present to the final master plan hearing for the South Platte Park. He briefly described the planning process and noted that the presentation which would be heard during the evening was a culmination of many years of planning efforts on behalf of many interested and concerned people.

Mr. Goodson extended congratulations to the City of Littleton for the persistent steps which have led to the acquisition of the 640 acre park, and added that the District is pleased to be able to assist the City in making the area what it is intended to be.

Mr. Goodson introduced Council members and staff from the City: co-chairing the session, Mr. Charles Emley; also in attendance were Council members Samuel Harper and James Taylor. Assisting in the public hearing were staff members Gale Christy, City Manager, Joe Gryniwicz, Andy McMinimee, and Jon Payne. Mr. Payne and South Suburban staff member Mary Weber-Quinn would be making the initial presentation of the proposed park plan to the public.

Mr. Goodson outlined the general order of the evening's events, noting that the hearing has been officially posted as a special meeting for the Directors of South Suburban.

Noting that the proposed Ken Caryl crossing of the Platte River is still a possibility, Mr. Goodson invited Mr. Christy to outline the City's position on that matter. Mr. Christy stated that the park plan illustrates two alternatives regarding the Ken Caryl crossing--one without, and one which shows the approximate pathway of the road. City Council has concluded that the City will pursue the road crossing and feels

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that it will be the best possible answer to the east/west traffic problems now being experienced. Mr. Christy also stated that he hoped the attendees at the evening's public hearing would not enter into a debate concerning the road crossing--the matter was not an issue in relation to the proposed park plan.

Mr. Goodson reported that the District had been contracted by City in June of 1982 for the management of the park and to complete the final master planning processes. He noted that the proposed plan has been presented to a number of small interest groups throughout the area and has had fairly wide public attention. Mr. Goodson stated that at the completion of the evening's public hearing, the South Suburban Directors would be taking formal action concerning the proposal and also reported that City Council action will be scheduled for a meeting later in April.

Mr. Goodson then introduced Mr. Payne and Mrs. Weber-Quinn.

Mr. Payne briefly outlined the long-term steps which had been taken in order to complete the acquisition of the park land involved in the "Littleton floodplain park." He stated that the proposed plan seems to very clearly describe the objectives that the City has envisioned for many years for the park. Mr. Payne also complimented South Suburban staff for so ably preparing the planning document, gathering materials relating to the park, and so forth.

Mrs. Weber-Quinn, with the aid of a slide presentation then presented the proposed master plan of the South Platte Park. Mrs. Weber-Quinn reiterated that while two "maps" had been prepared, showing the park with and without the Ken Caryl crossing, the park development was intact as one concept and that approval of the complete package is being sought.

Mrs. Weber-Quinn then described the various aspects of the park development, pointing out the long-term phasing of the plan. The park is divided conceptually into three major areas, including the northwest quadrant which is being mined, under lease, by Cooley Gravel Company. This activity will terminate in 1994 and at that time the public will have access to that area which has been identified as the third phase of the park.

Mrs. Weber-Quinn referenced the inventory maps which have been prepared during the summer of 1982 and which identify a number of features of the park, i.e., climate, geology, soils, vegetation and wildlife, and so forth.

Mrs. Weber-Quinn identified the problem of access as being a major consideration at this time, indicating that the most popular entry point to the park is both illegal and dangerous.

(Please note that the document, "South Platte Park Master Plan", is attached to and made a permanent part of the District's records.)

At the conclusion of the plan presentation, questions from the public were entertained, with Mr. Payne and Mrs. Weber-Quinn responding.

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Mrs. Jennie Staritzky, a resident of the Happy Homes subdivision in western Littleton, inquired about the proposed location of the visitor center, expressing concern particularly that it be constructed outside the "floodplain." Mr. Payne described the boundaries of the park and explained that technically there are areas of the park lying outside the 100 year floodplain. The Corps has reported that the river's natural flow has an east-to-west movement and also described the "erosion limit" attached to the land. At any rate, the visitor center was described as planned for an area outside the typical floodplain.

Mr. Houston Waring, a resident of Geneva Village, inquired about the potential hazards of the gravel pit lakes which have been created by mining activities. Mr. Payne responded that reclamation efforts will follow the guidelines set by the State and that the lakeshores will be re-worked to provide shallow water several feet out from shore lines.

Mr. Waring also inquired about the channelization project and Mr. Payne reported that the Platte River, as it flows through the entire South Platte Park will remain in the form of a meandering river--not formally channelized as it is proposed to be further downstream. Referring to the drawings, Mr. Waring inquired about the total acreage of the park and of the lakes within the park. Of the 640 acre park, approximately 250 acres will be lake surfaces.

Mrs. Weber-Quinn confirmed the proposed access points to the park and indicated the most immediate points of access at the Wolhurst Mobile Home Community and at the Wolhurst townhome project. She also confirmed that a strong recommendation is being made to the State Highway Department to totally close the access which is currently being used at the south end of the park (both illegal and dangerous) and which involves vehicular traffic exiting from C-470.

In regard to crossing the river within the park, Mrs. Weber-Quinn confirmed that wading across is required at this point. A pedestrian bridge has been proposed for phase II installation.

Mr. Bob Searns noted that the area was a very fine one for canoeing and asked about access to be provided from the south end of the park. Mrs. Weber-Quinn reiterated earlier comments about the illegal access from C-470 being closed, but noted it would be ideal if canoeists drove to the park entry area off Santa Fe Drive, parked their vehicles and carried canoes along the trails to sandy beach areas for launching. In response to an additional question from Mr. Searns, Mrs. Weber-Quinn reported that the Colorado State Trail Plan addresses a proposed trail for the north side of C-470 which will connect with the Columbine Trail progressing to Chatfield State Recreation Area and, additionally, to the South Platte Park.

A Columbine Valley resident, Mrs. Tuck, inquired about the possibility of fencing the park to protect or separate residential areas from the public use areas. Mrs. Weber-Quinn responded by noting that proposed plantings of various native species will hopefully prevent traffic in and out of the park except at the designated access points. If all else fails, she said, some fencing may have to be installed in particularly sensitive areas of the park boundary.

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Mr. Mike Staritzky, a teacher involved with environmental education, inquired as to why School District 6 educators had not been contacted regarding the master plan and public hearing. Mrs. Weber-Quinn confirmed that she has met several times with Jane Watson, Coordinator of Environmental Education for the Littleton School District and also indicated that a notice of the hearing had been sent to Jane Watson.

Mr. Jack Anderson, a resident of Highlands Ranch and another teacher associated with School District 6, reported that there are major hunting and trapping activities which he hoped will be eliminated within the park. Mrs. Weber-Quinn agreed with this request and indicated that training sessions will be held for park ranger personnel. Staff will be instructed on how to spot traps, patrol techniques, and so forth. Careful observation and continuing educational measures may eventually eliminate poaching and trapping activities.

In relation to this concern, Mrs. Weber-Quinn further described the proposed management techniques which will be used at the park--rangers will be on the site, full-time, and their duties will include contacting park visitors regarding rules and regulations, patrolling various entrances to the park, and so forth. Mrs. Weber-Quinn also reported that the Arapahoe County Sheriff officers, Littleton Police Department, and the South Suburban Park Police have all been excellent back-up persons if law enforcement problems entered the picture. The rangers, she added, have no law enforcement authority.

Mrs. Startitzky, noting the anticipated increase in park visitors, inquired as to how many additional rangers will be put on staff during the summer of 1983 and how many additional policemen will be hired by City of Littleton to handle the South Platte Park enforcement duties. Both Mr. Castleberry and Mr. Christy responded that no additional staff is deemed necessary at this time and both indicated that the ranger crews will be adequate to manage park visitors.

Mrs. Weber-Quinn further explained that people "breaking the law" in the park usually are doing so because they are unaware of the law--the policies and regulations will become more familiar to more and more visitors and she could foresee that education of the public will be the answer to most of the problems. Mrs. Weber-Quinn, responding to Mr. Christy's request, also described other duties of the park rangers which will include trail construction, trash pick-up, nature observations, continuing resource inventorying, and most of all, positive contact with park visitors.

Mr. Matt Vincent, reporter from the Independent newspaper, inquired about the need for and ability of management to limit access to the park--can limitations actually be accomplished? Mrs. Weber-Quinn referred to the permit system and check-in points in use at other large area parks, i.e., Cherry Creek and Chatfield. She indicated that should the "people carrying capacity" of the park be reached, and the facility threatened by over-use, the total visitor count would indeed have to be monitored and limits set.

Mr. Brad Buckner, a resident of Douglas County, speaking to the proposed limited access to the park, inquired whether it was the intent of the City or of South Suburban to limit the visitors to "District residents or City of Littleton residents only." Mrs. Weber-Quinn assured him that this was not the intent.

Mrs. Staritzky inquired as to what plans are being made to keep park visitors from "trespassing" onto the Cooley mining property during those years when the mining activity is in progress. It was reported that this may become a problem but that massive signage is planned; Cooley maintains a security program; and continued education efforts will all contribute to helping solve this potential problem.

Mr. Castleberry interjected that the park has been "manned" for only one season—lots of data has been collected and more and more information is being learned almost on a daily basis. All the questions concerning the operation of the park cannot be satisfactorily answered right now—but staff is learning to do a better job.

Referencing the employment of five full-time park rangers for the summer of 1983, Mr. Waring inquired if such an expense is considered worthwhile—what exactly will they be trying to stop within the park? Mrs. Weber-Quinn reported the types of violations noted in last summer's operation of the park and indicated that public contact had been made in regard to illegal poaching, hunting, trapping, garbage dumping, shooting BB's at birds, lake swimming (presently in violation of the regulations), use of motorized vehicles, and so forth. She reiterated that many people were simply unaware that there were regulations designed to govern the area and protect the safety of visitors.

Mr. Vincent stated that he was aware of the City's position on the Ken Caryl crossing and inquired what South Suburban's position might be. Mr. Goodson responded by noting that the District has taken no official position on the question, considering the matter to be outside the realm of park and recreation services.

In answer to Mr. Vincent's earlier question, Mrs. Weber-Quinn briefly described the 10-year proposed expenditures planned to provide construction, development and operation of the park, and indicated that a total figure of approximately \$1,000,000 will provide all planned park amenities within the three phases of planning outlined in the master plan.

Mr. Staritzky, referencing the use of the park as an environmental education resource for School District 6, indicated that he felt it was too rigid to impose training on all teachers who intended to visit the park with student groups. He suggested that park management arrange to visit the involved instructors during in-service training days and provide the necessary information to the teachers in that fashion. Additionally, Mr. Staritzky indicated that it would be wise to provide parking facilities that could handle two or three school buses at a time—too restrictive a number limit might prohibit the schools from using the resource. The specified number of "30 students and one teacher" would make it difficult for the schools to visit the park. Mr. Anderson expressed his agreement and suggested that perhaps even 90 students being sent with appropriate leadership would be more ideal, better utilization of school buses, and so forth.

Mrs. Staritzky stated that she believed the proposed plan was good, but asked the Board and Council to consider an amendment which would dictate that the visitor center be planned for one location, no matter what eventually happens regarding the proposed Ken Caryl crossing. Even if the City needs to buy more land to accommodate a visitor center, she felt this would be an important step in assuring that the planned

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development will be completed and that the Ken Caryl crossing could go through without disrupting the park.

She made one other comment to the effect that there may be some serious problems occurring within the park--drug usage, illegal use of firearms, etc., and recommended that close monitoring occur so that the eventual "good" of the Park will not be negated by these types of problems. Adequate and additional police protection, she said, may become a necessity.

Mr. Goodson, referring to Mrs. Staritzky's request for an amendment to the plan, noted that the joint agreement between South Suburban and the City will not allow any change in the plan in the future without public hearings, joint approvals, and so forth. Regarding the Ken Caryl crossing and its eventual impact on the park, Mr. Goodson reminded the group that the District will not be announcing a position on the matter and that, since the plan has allowed for this possibility, he could see no major problem with the alternative. Referring to her request for additional police protection, Mr. Goodson assured her that the park management will not let potential problems get so large that they cannot be easily solved. Eventually, he said, increased park police staff and patrol activity may become desirable.

There being no further questions from the public, Mrs. Weber-Quinn read aloud a letter which had been received from the Cooley Gravel Company relating to the proposed plan. The letter basically pledged continued cooperation and communication with the City and the District concerning the management and development of South Platte Park.

A gentleman from the Colorado Division of Wildlife indicated that he had been involved in the project for approximately three years and that the Division will be making a formal response concerning the master plan. Meanwhile, he urged Council and Board to accept and approve the master plan. He described the park as having a tremendous potential for becoming a very very unique place within a heavily populated urban area.

Mr. Goodson indicated that further consideration concerning the park and its development would be made at future reviews and evaluations. Regarding the proposed site for a visitor center, he said, final decisions can be postponed and re-evaluated at future hearings.

Mr. Emley reported that the City Council will take formal action on the proposed master plan at its regularly scheduled April 19 meeting. Mr. Goodson, again noting that the public hearing had been identified as a special meeting for the South Suburban Directors, called for a motion.

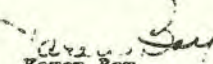
DR. MILLIKEN MOVED THAT THE BOARD OF DIRECTORS OF SOUTH SUBURBAN METROPOLITAN RECREATION AND PARK DISTRICT ACCEPT THE PROPOSED MASTER PLAN FOR THE SOUTH PLATTE PARK AS PRESENTED; motion seconded by Mrs. Heggland and approved, 3-0. Mr. Goodson stated that he would like to take the prerogative of adding his vote in favor of the approval, noting that it was a unanimous decision to approve the plan.

In summary, Mr. Goodson expressed his pleasure at the very professional plan which had been presented to the group and expressed appreciation

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for the in-depth study of the park and for the thoughtful proposals which had been made. The work, he said, indicated to him that the future of the park is in good hands and would help to provide a unique area for generations to come.

There being no other business to come before the Board, the public hearing on the South Platte Park Master Plan was adjourned at 8:45 p.m.


Karen Bay
Administrative Assistant

APPENDIX III: SPECIES LISTS

SPECIES LIST: OBSERVED WILDLIFE IN STUDY AREA
(Fall 1975, Summer 1982)

SALIENTIA (Frogs and Toads)

Bullfrog (Rana catesbeiana)

SERPENTES (Snakes)

Bull Snake (Pituophis melanoleucus)

Garter Snake (Thamnophis sirtalis)

Rattlesnake (Crotalus horridus)

SAVRIA (Lizards)

Six-lined Lizard (Cnemidophorus sexlineatus)

CICONIIFORMES (Hérons, Storks, and Allies)

Great Blue Heron (Ardea herodias)

ANSERIFORMES (Waterfowl)

Canadian Goose (Branta canadensis)

FALCONIFORMES (Diurnal Birds of Prey)

Red-tailed Hawk (Buteo jamaicensis)

GALLIFORMES (Fowl-like Birds)

Ring-necked Pheasant (Phasianus colchicus)

CHARADRIIFORMES (Shorebirds, Gulls, and Auks)

Common Snipe (Capella gallinago delicata)

Killdeer (Charadrius vociferus)

Ring-billed Gull (Larus delawarensis)

COLUMBIFORMES (Sandgrouse, Dodos, Pigeons, and Doves)

Mourning Dove (Zenaidura macroura)

STRIGIFORMES (Owls)

Great Horned Owl (Bubo virginianus)

CAPRIMULGIFORMES (Goatsuckers and Their Allies)

Common Night Hawk (Chordeiles minor)

CORAACIIFORMES (Kingfishers and Their Allies)

Belted Kingfisher (Megaceryle alcyon)

PICIFORMES (Woodpeckers and Their Allies)

Downy Woodpecker (Dendrocopos pubescens)

Red-shafted Flicker (Colaptes cafer)

PASSERIFORMES (Perching Birds)

Black-billed Magpie (Pica pica)

Dipper Water Ouzel (Cinclus mexicanus)

Red-winged Blackbird (Agelaius phoeniceus)

Robin (Turdus migratorius)

Rough-winged Swallow (Stelgidopteryx ruficollis)

Starling (Sturnus vulgaris)

Western Kingbird (Tyrannus verticalis)

Western Meadowlark (Sturnella neglecta)

CHIROPTERA (Bats)

Bat (species unknown)

RODENTIA (Rodents)

Beaver (Castor canadensis)

Gray Squirrel (Sciurus carolinensis)

Muskrat (Ondatra zibethicus)

Prairie Dog (Cynomys ludovicianus)

Red Squirrel (Tamiasciurus hudsonicus)

Thirteen-lined Ground Squirrel (Citellus tridecemlineatus)

CARNIVORA (Carnivores)

Coyote (Canis latrans)

Common Skunk (Mephitis mephitis)

Raccoon (Procyon lotor)

Red Fox (Vulpes fulva)

LAGOMORPHA (Hares and Rabbits)

Cottontail Rabbit (Sylvilagus floridanus)

ARTIODACTYLA (Even-toed Hoofed Mammals)

Mule Deer (Odocoileus hemionus)

White-tailed Deer (Odocoileus virginiana)

SPECIES LIST: OBSERVED FLORA IN STUDY AREA
(Fall 1974, Summer 1982)

ACERACEAE

Inland Boxelder (Acer negundo L. var. interius (Britt.) Sarg.)

ALISMACEAE

Common Arrowhead (Sagittaria latifolia Willd.)

AMARANTHACEAE

Prostrate Amaranth (Amaranthus blitoides L.)

Redroot Pigweed (Amaranthus retroflexus L.)

ANACARDIACEAE

Poison Ivy (Rhus radicans L.)

Skunkbush Sumac (Rhus trilobata Nutt. ex T. & G.)

APIACEAE

Western Water Hemlock (Cicuta douglasii (DC) Coult. & Rose)

Spotted Hemlock (Conium maculatum L.)

Wild Carrot (Daucus carota L.)

Cow Parsnip (Heracleum lanatum Michx.)

ASCLEPIADACEAE

Swamp Milkweed (Asclepias incarnata L.)

Showy Milkweed (Asclepias speciosa Torr.)

ASTERACEAE

Yarrow (Achillea lanulosa Nutt.)

Western Ragweed (Ambrosia coronopifolia T. & G.)

Common Ragweed (Ambrosia elatior L.)

Giant Ragweed (Ambrosia trifida L.)

Common Burdock (Arctium minus (Hill) Bernh.)

Fringed Sage (Artemisia frigida Willd.)

Louisiana Sage (Artemisia ludoviciana Nutt. ssp. ludoviciana)

White Woody Aster (Aster commutatus var. crassulus (Rydb.) Blake)

Heath Aster (Aster ericoides L. var. commutatus (T. & G.) Boivin)

Nodding Beggarstick (Bidens cernua L.)

Bristle Thistle (Carduus leiophyllus Petrovic ex Bornm.)

Russian Centaurea (Centaurea picris Pall.)

Diffuse Centaurea (Centaurea diffusa Lam.)

Rubber Rabbitbrush (Chrysothamnus nauseosus ssp. pinifolius (Greene) H&C)

Chicory (Cichorium intybus L.)

Canada Thistle (Cirsium arvense (L.) Scop. var. arvense)

Bull Thistle (Cirsium lanceolatum (L.) Hill)

Horseweed (Conyza canadensis (L.) Cronq.)

Whiplash Fleabane (Erigeron flagellaris A. Gray)

Povertyweed (Franeria discolor Nutt.)

Curlycup Gumweed (Grindelia squarosa (Pursh) Duval)

Broom Snakeweed (Gutierrezia sarothrae (Pursh) Britt & Rusby)

Annual Sunflower (Helianthus annuus L.)
 Hairy Goldenaster (Heterotheca villosa (Pursh) Shinnars)
 Prickly Lettuce (Lactuca scariola L.)
 Dotted Gayheat her (Liatris punctata Hook.)
 Prairie Coneflower (Ratibida columnifera (Nutt) Woot. et Stordl.)
 Groundsel (Senecio rapifolius Nutt.)
 Broom Groundsel (Senecio spartioides T. & G.)
 Decumbent Goldenrod (Solidago decumbens var. oreophila (Rydb.) Fernald)
 Canada Goldenrod (Solidago canadensis L.)
 Dandelion (Taraxacum officinale Web. in Wiggars)
 Greenthread (Thelesperma megapotamicum (Spreng) Kuntz)
 Meadow Salsify (Tragopogon pratensis L.)
 Showy Goldeneye (Viguiera multiflora (Nutt) Blake)
 Italian Cocklebur (Xanthium italicum Moretti)

BETULACEAE

Alder (Alnus tenuifolia Nutt.)
 River Birch (Betula occidentalis Hook.)

BORAGINACEAE

Hairy Stickseed (Lappula redowski (Hornem) Greene)

BRASSICACEAE

Shepherd's Purse (Capsella bursa-pastoris (L.) Medic.)
 Little Seed False Flax (Camelina microcarpa Andr. in D.C.)
 Whitetop (Cardaria draba (L.) Desv.)
 Tansy Mustard (Descurainia sophia (L.) ex Prantl.)
 Mountain Pepperweed (Lepidium montanum Nutt.)
 Claspig Pepperweed (Lepidium perfoliatum L.)
 Watercress (Rorippa nasturtium-aquaticum (L.) Schinz & Thell)
 Tumble Mustard (Sisymbrium altissimum L.)
 Field Pennyress (Thlaspi arvense L.)

CACTACEAE

Prickly Pear (Opuntia phaeacantha Englem. ex A. Gray)

CAPPARIDACEAE

Rocky Mountain Bee Plant (Cleome serrulata Pursh)

CAPRIFOLIACEAE

Snowberry (Symphoricarpos albus (L.) Blake)

CARYOPHYLLACEAE

Bouncingbet (Saponaria officinalis L.)

CHENOPODIACEAE

Lamb's Quarter (Chenopodium album L.)
Belvedere Summer (Kochia scoparia (L.) Schrad.)
Russian Thistle (Salsola kali-tenuifolia L.)

CONVOLVULACEAE

European Bindweed (Convolvulus arvensis L.)

CYPERACEAE

Common Spikesedge (Eleocharis macrostachya Britt. in Small)
Sedge (Carex spp.)
Tule Bulrush (Scirpus acutus Muehl. ex Bigelow)

ELEAGNACEAE

Russian Olive (Eleagnus angustifolia)

EQUISETACEAE

Field Horsetail (Equisetum arvense L.)

EUPHORBIACEAE

Snow-on-the-Mountain (Euphorbia marginata Pursh)
Robust Spurge (Euphorbia robusta) (Engelm) in Britt. & Brown)
Thymeleaf Spurge (Euphorbia serpyllifolia Pers.)

GERANIACEAE

Alfileria (Erodium cicutarium (L.) ex Ait)

HALORAGIDACEAE

Parrotfeather (Myriophyllum spicatum L.)

HYDROCHARITACEAE

Canada Waterweed (Elodea canadensis Aigh. Michx.)

HYDROPHYLLACEAE

Varileaf Phacelia (Phacelia heterophylla Pursh)
New Mexico Phacelia (Phacelia neomexicana Thurber ex Torr.)

JUNCACEAE

Poverty Rush (Juncus tenuis var. dudleyi (Wieg.) F.J. Herm.)
Torrey Rush (Juncus torreyi Coville)

JUNCAGINACEAE

Arrowgrass (Triglochin maritima L.)

LAMIACEAE

Common Motherwort (Leonurus cardiaca L.)
Common Horehound (Marrubium vulgare L.)

Field Mint (Mentha arvensis L.)
Horsemint (Monarda fistulosa L.)
Catnip (Nepeta cataria L.)

LEGUMINOSAE

American Licorice (Glycyrrhiza lepidota Pursh)
Black Medic (Medicago lupulina L.)
Alfalfa (Medicago sativa L.)
White Sweetclover (Melilotus alba Desc.)
Yellow Sweetclover (Melilotus officinalis (L.) Lam.)
Slimflower Scurfpea (Psoralea tenuiflora Pursh)
Spreading Thermopsis (Thermopsis divaricarpa A. Nels)
Red Clover (Trifolium pratense L.)
White Clover (Trifolium repens L.)

LEMNACEAE

Duckweed (Lemna minor L.)

LILIACEAE

Asparagus (Asparagus officinalis L.)

MALVACEAE

Common Mallow (Malva neglecta L.)

NYCTAGINACEAE

Snowball Sand Verbena (Abronia fragrans Nutt. ex Hook.)
Narrow-leaf 4 o'clock (Mirabilis linearis (Pursh) Heimerl.)

NAGRACEAE

Sticky Willowweed (Epilobium adenocaulon Hausskn.)
Velvet Weed (Gaura parviflora Dougl. ex Hook.)
Erect Evening Primrose (Oenothera strigosa (Rydb.) Mack & Bush)

PAPAVERACEAE

Prickle Poppy (Argemone intermedia Sweet)

PLANTAGINACEAE

Buckhorn Plantain (Plantago lanceolata L.)
Rippleseed Plantain (Plantago minor L.)
Wooly Indianwheat (Plantago purshii Roem. & Schult.)

POACEAE

Crested Wheatgrass (Agropyron desertorum)
Bluestem Wheatgrass (Agropyron smithii var. Molle (Scribn. & Smith) Jones)
Little Bluestem (Andropogon hallii)
Side-oats Grama (Bouteloua curtipendula)
Blue Grama (Bouteloua gracilis HBK Lag ex Steud.)
Smooth Brome (Bromis inermis)

Cheatgrass Brome (Bromis tectorum L.)
Buffalo Grass (Buchloe dactyloides)
Orchard Grass (Dactylis glomerata)
Barnyard Grass (Echinochloa crusgalli (L.) Beauv.)
Canada Wildrye (Elymus canadensis L.)
Foxtail Barley (Hordeum jubatum L.)
Timothy (Phleum pratense)
Kentucky Bluegrass (Poa pratensis L.)
Ribbitfoot Polypogon (Polypogon monspeliensis (L.) Desf.)
Yellow Foxtail (Setaria lutescens)
Squirreltail (Sitanion hystrix)

POLEMONIACEAE

Sticky Gilia (Gilia calcarea M. E. Jones)
Canada Gilia (Gilia candida Rydb.)
Spike Gilia (Gilia spicata Nutt.)

POLYGONACEAE

Bushy Eriogonum (Eriogonum effusum Nutt.)
Water Ladysthumb (Polygonum amphibium L.)
Prostrate Knotweed (Polygonum aviculare L.)
Marshpepper (Polygonum hydropiper L.)
Pennsylvania Smartweed (Polygonum pennsylvanicum L.)
Sheep Sorrel (Rumex acetosella L.)
Tall Dock (Rumex altissimus Wood)
Curly Dock (Rumex crispus L.)
Veiny Dock (Rumex venosus Pursh)

POTAMOGETONACEAE

Pondweed (Potamogeton nodosus Poir. in Lam.)
Fennelleaf Pondweed (Potamogeton pectinatus)

PORTULACACEAE

Purslane (Portulaca oleraceae L.)

RANUNCULACEAE

Virginsbower (Clematis ligusticifolia Nutt. ex T. & G.)
Geyer Larkspur (Delphinium geyeri Greene)
Nelson Larkspur (Delphinium nelsoni Greene)
Plains Larkspur (Delphinium virescens Nutt.)
Watercrowfoot (Ranunculus aquatilis L.)
Shore Buttercup (Ranunculus cymbalaria Pursh)
Purple Meadowrue (Thalictrum dasycarpum)

ROSACEAE

Utah Serviceberry (Amelanchier utahensis Koehne)
Fireberry Hackberry (Crataegus chrysocarpa Ashe)

Fleshy Hackberry (Crataegus succulenta Schrad. ex Link)
Northwest Cinquefoil (Potentilla gracilis Dougl.)
Montpelier Cinquefoil (Potentilla monspeliensis)
Wild Plum (Prunus americana Marsh.)
Chokecherry (Prunus virginiana L.)
Woods Rose (Rosa woodsii Lindl.)
Thimbleberry (Rubus deliciosus Torr.)

SALICACEAE

Lanceleaf Cottonwood (Populus acuminata Rydb.)
Narrowleaf Cottonwood (Populus angustifolia James)
Plains Cottonwood (Populus sargentii Dode)
Peachleaf Willow (Salix amygdaloides Anderss.)
Whiplash Willow (Salix caudata (Nutt.) Meller)

SAXIFRAGACEAE

Golden Currant (Ribes aureum Dougl.)
Wax Currant (Ribes cereum Pursh.)

SCHROPHULARIACEAE

Whole leaf Paintbrush (Castilleja integra Gray in Torr.)
Gerardia (Gerardia tenuifolia Vahl.)
Butter and Eggs (Linaria vulgaris Mill.)
Narrowleaf Penstemon (Penstemon angustifolia Nutt. ex Pursh)
Sidebells Penstemon (Penstemon secundifolius Benth. in DC)
Green Penstemon (Penstemon virens Pennell ap. Rydb.)
Mullein (Verbascum thapsus L.)
American Speedwell (Veronica americana Schweinn. ex Benth. in DC)

SOLANACEAE

Black Nightshade (Solanum nigrum L.)
Buffalobur (Solanum rostratum Dunal)
Nightshade (Solanum sarachoides Sendt ex Mart.)
Cut-leafed Nightshade (Solanum triflorum Nutt.)

TYPHACEAE

Narrowleaf Cattail (Typha angustifolia L.)
Common Cattail (Typha latifolia L.)

URTICACEAE

Stinging Nettle (Urtica dioica-procera (Muhl.) Wedd.

ULMACEAE

Hackberry (Celtis occidentalis L.)

VERBENACEAE

Bigbrack Verbena (Verbena bracteata Lag. and Rodn.)
Blue Verbena (Verbena hastata L.)

VITACEAE

Virginia Creeper (Parthenocissus vitacea (Knerr) Mitchc.)

Wild Grape (Vitis vulpina L.)

VIOLACEAE

Nuttall's Violet (Viola nuttalli Pursh.)

ZYGOPHYLLACEAE

Puncture Vine (Tribulus terrestris L.)

SPECIES LIST: OBSERVED FISH IN STUDY AREA
(Fall 1974, Summer 1982)

SALMONIDAE (Salmon and Trout)

Brown Trout (Salmo trutta)

Rainbow Trout (Salmo gairdneri)

CATOSTOMIDAE (Suckers)

Longnose Sucker (Catostomus catostomus)

Western White Sucker (Catostomus commersoni)

CYPRINIDAE (Minnows, Shiners, and Dace Carp)

Common Carp (Cyprinus carpio)

Common Shiner (Notropis cornutus)

Creek Chub (Semotilus atromaculatus)

Fathead Minnow (Pimephales promelas)

Longnose Dace (Rhinichthys cataractae)

Sand Shiner (Notropis stramineus)

ICTALURIDAE (Catfish)

Black Bullhead (Ictalurus melas)

Channel Catfish (Ictalurus punctatus)

CENTRARCHIDAE (Sunfish)

Black Crappie (Pomoxis nigramaculatus)

Bluegill (Lepomis macrochirus)

Green Sunfish (Lepomis cyanellus)

Largemouth Bass (Micropterus salmoides)

Pumpkinseed (Lepomis gibbosus)

Smallmouth Bass (Micropterus dolomieu)

PERCIDAE (Perches)

Yellow Perch (Perca flavescens)

APPENDIX IV: AGREEMENTS

alc 78-215

G/L 50367
Fund 1001
C153226

AGREEMENT BETWEEN

THE COLORADO WATER CONSERVATION BOARD

A DIVISION OF THE DEPARTMENT OF NATURAL RESOURCES,

STATE OF COLORADO

AND

THE CITY OF LITTLETON, COLORADO

SOUTH PLATTE RIVER, LITTLETON OPEN-SPACE PARK LAND ACQUISITION

THIS AGREEMENT entered into this 13th day of October, 1977 by and between the State of Colorado by and through the Colorado Water Conservation Board, Department of Natural Resources (hereinafter called the "State"), and the City of Littleton (hereinafter called the "City"), WITNESSETH THAT:

WHEREAS, construction of channel and levee improvements along the South Platte River between the Chatfield Lake Project and Denver was authorized by Section 204 of the Flood Control Act of 1950 (Public Law 516, 81st Congress, 2nd Session); and

WHEREAS, Section 88 of the Water Resources Development Act of 1974, Public Law 93-251, modified the Flood Control Act of 1950 to authorize the United States of America to participate with local interests in the acquisition of land and interest therein necessary for flood control purposes in lieu of a portion of the authorized channel improvements, with the required land available for potential collateral recreation uses, the State and the City agree that such federal participation, as described in an agreement between the State and the United States of America dated September 7, 1977, will be limited to Reach One of the Project as below described; and

WHEREAS, the Project has been divided into three distinctive "reaches" (Reach One extending from the upstream limit of the Project located at the federal acquisition line of the Chatfield Lake Project to the site of a new channel control weir to be located approximately due east of the street named Fairway Lane in the Town of Columbine Valley; Reach Two extending from that same weir to the present West Oxford Avenue Bridge Crossing; and Reach Three extending from that bridge crossing to the downstream limit of the Project located at the present West Hampden Avenue Bridge Crossing) for the purpose of locating individual measures to be implemented; and

WHEREAS, the City hereby represents that it has the authority and capability to furnish the non-Federal cooperation required by the Federal legislation authorizing the flood control works and by other applicable law; and

WHEREAS, the State, on the 7th day of September, 1977, entered into an agreement with the United States of America, by and through the Corps of Engineers to acquire the lands and interest therein for that portion of the Project described as Reach One necessary for flood control purposes in lieu of the authorized channel improvements; and

WHEREAS, this agreement supersedes and rescinds any and all prior agreements and assurances that the parties to this agreement have previously entered into in regards to the subject matter of this agreement.

NOW, THEREFORE, the parties agree as follows:

1. The City agrees that it shall fulfill the requirements of non-Federal cooperation, to-wit:

a. Provide without cost to the State all land, easements, and rights-of-way necessary for construction of the improvements for

Reach One in the area of the new channel control weir and sediment retention basin as stated above and, in consideration of that Federal participation outlined under Paragraph 3 of this contract, provides lands and interests therein necessary for flood control purposes in Reach One, as shown on Exhibit A. The City agrees to acquire the lands and interests required for Reach One, or show possession as required by Colorado law on or before the 31st day of December, 1978, unless such possession is delayed by proceedings in an Appellate Court, but in any event to acquire such lands and interests on or before the date the construction work in Reaches Two and Three is completed, prevent any encroachments in needed floodplain detention areas of Reach One which would reduce their capability for flood detention and perform without cost to the State, in conjunction with providing all real estate interests, all necessary removal, alteration, modification, or relocation of existing bridges, streets, highways, and utilities that are required for Reach One.

b. Hold and save the State of Colorado free from damages due to the construction, operation and maintenance of Reach One, except where such damages are due to the fault or negligence of the United States, State of Colorado or their contractors. This hold and save includes, but is not limited to the acquisition of lands and interests therein in lieu of Federal-performed channel improvements in Reach one, including the maintenance and operation of the floodplain detention areas. This hold and save harmless clause shall not extend to the city officials in their individual capacities.

c. ~~Keep~~ Maintain and operate the sediment detention basin and the

~~channel control weir after completion~~ in accordance with regulations prescribed by the Secretary of the Army (Exhibit B) and the instructions specifically written for Reach One (Exhibit C).

d. Provide assurances of compliance with Department of Defense Directive 5500.11, Nondiscrimination in Federally Assisted Programs, published in the Federal Register, 31 December 1964, and any amendments thereto or implementation thereof, as may be required by the Secretary of the Army; and

e. Assure that affected persons will be adequately informed of the benefits, policies and procedures described in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) and in accordance with Sections 210 and 305 of said Act and implementing regulations, assure that, if applicable under said Act:

(1) Fair and reasonable relocation payments and assistance shall be provided to or for displaced persons, as is required to be provided by a Federal agency under Sections 202, 203, and 204 of said Act;

(2) Relocation assistance programs offering the services described in Section 205 of said Act shall be provided to such displaced persons;

(3) Within a reasonable period of time prior to displacement, decent, safe, and sanitary replacement dwellings will be available to displaced persons in accordance with Section 205 (c) (3) of said Act:

(4) In acquiring real property it will be guided, to the greatest extent practicable under State law, by the land acquisition policies in Section 301 and the provisions of Section

302 of said Act;

(5) Property owners will be paid or reimbursed for necessary expenses as specified in Section 303 and Section 304 of said Act.

2. The City hereby gives the State and the Corps of Engineers a right to enter upon, at reasonable times and in a reasonable manner, project lands which the City owns or controls, for access to Reach One for the purpose of inspection and for the purpose of repairing and maintaining Reach One if such inspection shows that the City for any reason is failing to manage, operate, repair and maintain the flood control works or flood detention areas in accordance with the assurances hereunder and has persisted in such failure after a reasonable notice in writing by the Corps of Engineers delivered to the City Manager of the City through the Director of the State's Water Conservation Board. No repair and maintenance by the United States or the State in such event shall operate to relieve the City of responsibility to meet its obligations as set forth in Paragraph 1 of this Agreement, or to preclude the United States or the State from pursuing any other remedy at law or equity.

3. The State agrees to participate with the City in the acquisition of lands and interests therein deemed necessary for flood control purposes for Reach One (as outlined in Exhibit A, attached hereto). Said participation will consist of providing Corps of Engineers' project funds to the City in an amount not to exceed \$603,560, except as hereinafter provided, as deemed by the Secretary of the Army to be the Federal share available under the authorization (Section 88, Public Law 93-251) according to the cost-sharing formula shown in Exhibit D, attached hereto. The Corps of Engineers' share under

Section 88, Public Law 93-251 is based upon an estimated total acquisition and administrative costs for the required lands currently estimated at \$550,000 to acquire the estate specified in Exhibit E. The City agrees that these ~~federal funds will be used exclusively for the acquisition of appropriate interests in the required land for~~ Reach One and appropriate acquisition costs and fees as permitted under federal or state law. The parties to this contract understand that the figure of \$550,000 identified as "Remaining Tracts" in the formula in Exhibit D, could change depending on what amount of money is actually spent in acquiring the necessary remaining tracts. The parties agree that the District Engineer of the Omaha District shall have the right to monitor each land acquisition activity of the City in acquiring the "Remaining Tracts." It is further agreed that the District Engineer ~~must~~ approve the amount of just compensation paid for any single tract, unless such just compensation is determined by a court following eminent domain proceedings. The City agrees that the State and Corps of Engineers shall have the right to audit all acquisition activities and that each acquisition proposal will be submitted to the State for payment, after the District Engineer approves of the just compensation, except that the State ~~agrees to approve payment to the City for immediate possession pursuant to and, in any amount ordered by a court to be paid into the~~ registry of said court for such possession. If the ultimate amount under "Total Corps Participation" in Exhibit D is more than the \$603,56 granted to the State by the Corps of Engineers, the State agrees to pay the additional amount to the City, but only to the extent that additional federal funds, if any, are made available to the State for that purpose. It is specifically understood by the parties to this agreement that any payment by the State to the City pursuant to any part of this

agreement shall be made only from funds furnished to the State by the Corps of Engineers under the agreement heretofore referred to and entered into by the State and the United States, acting through the Corps of Engineers, dated September 7, 1977, and that any financial responsibility of the State to the City under this agreement shall be limited solely to the funds received by the State from the United States pursuant to the agreement of September 7, 1977.

4. The laws of the State of Colorado and rules and regulations issued pursuant thereto shall be applied in the interpretation, execution and enforcement of this contract. Any provision of this contract whether or not incorporated herein by reference which provides for arbitration by any extra-judicial body or person or which is otherwise in conflict with said laws, rules and regulations shall be considered null and void. Nothing contained in any provision incorporated herein by reference which purports to negate this or any other special provision in whole or part shall be valid or enforceable or available in any action at law whether by way of complaint, defense or otherwise. Any provision rendered null and void by the operation of this provision will not invalidate the remainder of this contract to the extent that the contract is capable of execution.

5. The signatories hereto aver that they are familiar with 18-8-301, et seq. (Bribery and Corrupt Influences) and 18-8-401 et seq. (Abuse of Public Office) C.R.S. 1973, as amended, and that no violation of such provisions is present.

6. The signatories aver that to their knowledge, no state employee has any personal or beneficial interest whatsoever in the service or property described herein.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement

on the day first above written.

CITY OF LITTLETON

STATE OF COLORADO
RICHARD D. LAMM, GOVERNOR

By *Sally Parsons*
Council President

By *Robert D. Stull*
for HARRIS D. SHERMAN, EXECUTIVE DIRECTOR
DEPARTMENT OF NATURAL RESOURCES

ATTEST: *Orville D. Harrison*
City Clerk

COLORADO WATER CONSERVATION BOARD

Date: _____

By *Felix L. Spares*
FELIX L. SPARES, DIRECTOR

J. D. MacFARLANE
APPROVALS

ATTORNEY GENERAL *[Signature]*

CONTROLLER DAN S. WHITTEMORE

By *[Signature]*
Assistant Solicitor General
General Legal Services

By *[Signature]*

CITY ATTORNEY *[Signature]*

By *[Signature]*

TITLE 33—NAVIGATION AND
NAVIGABLE WATER

Chapter II—Corps of Engineers, War
Department

PART 208—FLOOD CONTROL REGULATIONS
MAINTENANCE AND OPERATION OF FLOOD
CONTROL WORKS

Pursuant to the provisions of section 3 of the Act of Congress approved June 22, 1936, as amended and supplemented (49 Stat. 1971; 50 Stat. 877; and 55 Stat. 638; 33 U. S. C. 701c; 701c-1), the following regulations are hereby prescribed to govern the maintenance and operation of flood control works:

§ 208.10 *Local flood protection works; maintenance and operation of structures and facilities—(a) General.* (1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits.

(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of War, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent," who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the right-of-way for the protective facilities.

(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the War Department or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work.

(6) It shall be the duty of the Superintendent to submit a semiannual report to the District Engineer covering inspection, maintenance, and operation of protective works.

(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works.

(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations.

(b) *Levees—(1) Maintenance.* The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structures in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth on areas riverward of the levees. Periodic inspections shall be made by the Superintendent to insure that the above maintenance measures are being effectively carried out and, further, to be certain that:

(i) No unusual settlement, sloughing, or material loss of grade or levee cross section has taken place;

(ii) No caving has occurred on either the land side or the river side of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring;

(iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;

(v) Drains through the levees and gates on said drafts are in good working condition;

(vi) No revetment work or riprap has been displaced, washed out, or removed;

(vii) No action is being taken, such as burning grass and weeds during inappropriate seasons, which will retard or destroy the growth of sod;

(viii) Access roads to and on the levee are being properly maintained;

(ix) Cattle guards and gates are in good condition;

(x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;

(xi) There is no unauthorized grazing or vehicular traffic on the levees;

(xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

Such inspections shall be made immediately prior to the beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days, and such intermediate times as may be necessary to insure the best possible care of

the levee. Immediate steps will be taken to correct dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accomplished during the appropriate season as scheduled by the Superintendent.

(2) *Operation.* During flood periods the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope and to be certain that:

(i) There are no indications of slides or sloughs developing;

(ii) Wave wash or scouring action is not occurring;

(iii) No low reaches of levee exist which may be overtopped;

(iv) No other conditions exist which might endanger the structure.

Appropriate advance measures will be taken to insure the availability of adequate labor and materials to meet all contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section.

(c) *Flood walls—(1) Maintenance.* Periodic inspections shall be made by the Superintendent to be certain that:

(i) No seepage, saturated areas, or sand boils are occurring;

(ii) No undue settlement has occurred which affects the stability of the wall or its water tightness;

(iii) No trees exist, the roots of which might extend under the wall and offer accelerated seepage paths;

(iv) The concrete has not undergone cracking, chipping, or breaking to an extent which might affect the stability of the wall or its water tightness;

(v) There are no encroachments upon the right-of-way which might endanger the structure or hinder its functioning in time of flood;

(vi) Care is being exercised to prevent accumulation of trash and debris adjacent to walls, and to insure that no fires are being built near them;

(vii) No bank caving conditions exist riverward of the wall which might endanger its stability;

(viii) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged.

Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. Measures to eliminate encroachments and effect repairs found necessary by such inspections shall be undertaken immediately. All repairs shall be accomplished by methods acceptable in standard engineering practice.

(2) *Operation.* Continuous patrol of the wall shall be maintained during flood periods to locate possible leakage at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or tie up to the wall. Should it become necessary during a flood emergency to pass anchor cables over the wall, adequate measures shall be taken to protect the concrete and construction joints. Immediate steps shall be taken to correct any condition which endangers the stability of the wall.

(d) *Drainage structures—(1) Maintenance.* Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on

drainage structures shall be examined, and trial operated at least once every 90 days. Where drainage structures are provided with stop log or other emergency closures, the condition of the equipment and its housing shall be inspected regularly and a trial installation of the emergency closure shall be made at least once each year. Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipes, gates, operating mechanism, riprap, and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures and that no fires are being built near bituminous coated pipes;

(iv) Erosion is not occurring adjacent to the structure which might endanger its water tightness or stability.

Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections.

(2) *Operation.* Whenever high water conditions impend, all gates will be inspected a short time before water reaches the invert of the pipe and any object which might prevent closure of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed as necessary to prevent inflow of flood water. All drainage structures in levees shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse condition.

(c) *Closure structures—(1) Maintenance.* Closure structures for traffic openings shall be inspected by the Superintendent every 90 days to be certain that:

(i) No parts are missing;

(ii) Metal parts are adequately covered with paint;

(iii) All movable parts are in satisfactory working order.

(iv) Proper closure can be made promptly when necessary;

(v) Sufficient materials are on hand for the erection of sand bag closures and that the location of such materials will be readily accessible in times of emergency.

Tools and parts shall not be removed for other use. Trial erections of one or more closure structures shall be made once each year, alternating the structures chosen so that each gate will be erected at least once in each 3-year period. Trial erection of all closure structures shall be made whenever a change is made in key operating personnel. Where railroad operation makes trial erection of a closure structure infeasible, rigorous inspection and drill of operating personnel may be substituted therefor. Trial erection of sand bag closures is not required. Closure materials will be carefully checked prior to and following flood periods, and damaged or missing parts shall be repaired or replaced immediately.

(3) *Operation.* Erection of each movable closure shall be started in sufficient time to permit completion before flood waters reach the top of the structure all. Information regarding the proper method of erecting each individual closure structure, together with an estimate of the time required by an experienced crew to complete its erection will be given

in the Operation and Maintenance Manual which will be furnished local interests upon completion of the project. Closure structures will be inspected frequently during flood periods to ascertain that no undue leakage is occurring and that drains provided to care for ordinary leakage are functioning properly. Boats or floating plant shall not be allowed to tie up to closure structures or to discharge passengers or cargo over them.

(i) *Pumping plants—(1) Maintenance.* Pumping plants shall be inspected by the Superintendent at intervals not to exceed 30 days during flood seasons and 90 days during off-flood seasons to insure that all equipment is in order for instant use. At regular intervals, proper measures shall be taken to provide for cleaning plant, buildings, and equipment, repainting as necessary, and lubricating all machinery. Adequate supplies of lubricants for all types of machines, fuel for gasoline or diesel powered equipment, and flash lights or lanterns for emergency lighting shall be kept on hand at all times. Telephone service shall be maintained at pumping plants. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be trial operated and checked at least once every 90 days. Megger tests of all insulation shall be made whenever wiring has been subjected to undue dampness and otherwise at intervals not to exceed one year. A record shall be kept showing the results of such tests. Wiring disclosed to be in an unsatisfactory condition by such tests shall be brought to a satisfactory condition or shall be promptly replaced. Diesel and gasoline engines shall be started at such intervals and allowed to run for such length of time as may be necessary to insure their serviceability in times of emergency. Only skilled electricians and mechanics shall be employed on tests and repairs. Operating personnel for the plant shall be present during tests. Any equipment removed from the station for repair or replacement shall be returned or replaced as soon as practicable and shall be trial operated after reinstallation. Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable.

(2) *Operation.* Competent operators shall be on duty at pumping plants whenever it appears that necessity for pump operation is imminent. The operator shall thoroughly inspect, trial operate, and place in readiness all plant equipment. The operator shall be familiar with the equipment manufacturers' instructions and drawings and with the "Operating Instructions" for each station. The equipment shall be operated in accordance with the above-mentioned "Operating Instructions" and care shall be exercised that proper lubrication is being supplied all equipment, and that no overheating, undue vibration or noise is occurring. Immediately upon final recession of flood waters, the pumping station shall be thoroughly cleaned, pump house sumps flushed, and equipment thoroughly inspected, oiled and greased. A record or log of pumping plant operation shall be kept for each station, a copy of which shall be furnished the District Engineer following each flood.

(g) *Channels and floodways—(1) Maintenance.* Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

(i) The channel or floodway is clear of debris, weeds, and wild growth;

(ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;

(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;

(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;

(v) Riprap sections and deflection dikes and walls are in good condition;

(vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

Such inspections shall be made prior to the beginning of the flood season and otherwise at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections. Measures will be taken by the Superintendent to promote the growth of grass on bank slopes and earth deflection dikes. The Superintendent shall provide for periodic repair and cleaning of debris basins, check dams, and related structures as may be necessary.

(2) *Operation.* Both banks of the channel shall be patrolled during periods of high water, and measures shall be taken to protect those reaches being attacked by the current or by wave wash. Appropriate measures shall be taken to prevent the formation of jams of ice or debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damage to banks, riprap, deflection dikes and walls, drainage cutlets, or other flood control structures repaired.

(h) *Miscellaneous facilities—(1) Maintenance.* Miscellaneous structures and facilities constructed as a part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior run-off during flood periods shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where practicable, shall provide for temporary raising during floods of bridges which restrict channel capacities during high flows.

(2) *Operation.* Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. Those facilities constructed as a part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless designed therefor. (49 Stat. 1571, 50 Stat. 877; and 55 Stat. 638; 33 U.S.C. 701c; 701c-1) (Regs. 9 August 1944, CE SPEWF)

[SEAL]

J. A. ULIO,

Major General,

The Adjutant General.

[P. R. Doc. 44-12285; Filed, August 16, 1944; 9:44 a. m.]

Approved: P. Ochs, Major.

Operation & Maintenance Requirements

Reach One of the South Platte River Channel Downstream of Chatfield Dam.

No physical obstructions shall be placed or landscaping measures undertaken in or adjacent to the channel which in the opinion of the Omaha District Engineer would adversely affect flood stages, or channel-bank stability, or otherwise artificially induce a tendency for the stream to meander. Moreover, naturally developing meanders which pose a potential threat to property, other than the property held by the sponsor, shall be controlled by timely placement of rock riprap or other suitable erosion protection to control such meanders.

Prior to taking any action that would affect the flood carrying capacity of the channel or floodway, the sponsor shall obtain written approval for such proposed action from the District Engineer, Omaha District, Corps of Engineers.

Table F-1
Determination of Corps of Engineers
Participation in Flood Plain Acquisition

Federal Construction Costs Saved	\$ 756,000 (1)
Non-Federal Costs Saved	<u>200,000 (2)</u>
TOTAL SAVINGS	\$ 956,000
Bureau of Outdoor Recreation Tracts	\$ 292,848 (3)
Dept. of Housing and Urban Development Tracts	179,900 (4)
City of Littleton Tracts	101,120 (5)
Remaining Tracts	<u>550,000 (6)</u>
TOTAL COST LANDS AND DAMAGES	\$1,123,868
Total Cost Lands and Damages	\$1,123,868
Subtract: Total Savings	<u>956,000</u>
AMOUNT ELIGIBLE FOR COST-SHARING	167,868
Federal Share (50 percent)	\$ 83,934
Subtract: BOR and DHUD Grants	<u>236,374</u>
ADDITIONAL CORPS CONTRIBUTION	\$ 152,440
Federal Construction Cost Saved	\$ 756,000
Additional Corps Contribution	<u>152,440 (7)</u>
TOTAL CORPS PARTICIPATION	\$ 603,560

- (1) Savings in Federal construction costs in Reach 1.
- (2) Non-Federal land and relocations costs saved in Reach 1.
- (3) Estimate of land costs upon which BOR made grants.
- (4) Estimate of land costs upon which DHUD made grants.
- (5) Actual cost of tracts purchased by city of Littleton.
- (6) Estimated costs for acquiring remaining lands.
- (7) Amount of potential Federal overpayment.

FEE SIMPLE ESTATE

The fee simple estate to the land described herein, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines; excepting and excluding therefrom all water rights and all sand, gravel, coal, oil and gas in and under said land and all appurtenant rights used in connection with the exploration, development, production and removal of said sand, gravel, coal, oil, and gas, including any existing structures and improvements; provided, however, that the said water rights, sand, gravel, coal, oil and gas and appurtenant rights so excepted and excluded are hereby subordinated to the prior right of the U. S. to flood and submerge the land as may be necessary in the construction, operation and maintenance of the project; provided further that any exploration or development of said water rights, sand, gravel, coal, oil and gas in and under said land shall be subject to Federal and State laws with respect to pollution of waters of the project, and provided that the type and location of any structure, improvement and appurtenances thereto now existing or to be erected or constructed on said land in connection with the exploration and/or development of said water rights, sand, gravel, coal, oil and gas, shall be subject to the prior written approval of the District Engineer, U. S. Army Engineer District, Omaha, Nebraska, or his duly authorized representative and provided further that the land underlying any flood control structures shall not be altered in any way for any purpose whatsoever without the prior written approval of the District Engineer, U. S. Army Engineer District, Omaha, Nebraska, or his duly authorized representative.

AGREEMENT

THIS AGREEMENT is made this 11th day of March, 1982, by and between the CITY OF LITTLETON, a municipal corporation of the State of Colorado (hereinafter "Littleton") and COOLEY GRAVEL COMPANY, a corporation of the State of Indiana qualified to do business in the State of Colorado (hereinafter "Cooley").

WHEREAS, the U.S. Army Corps of Engineers (hereinafter "Corps") has completed upstream improvements on the Chatfield Dam and is proceeding with development of flood control improvements to the South Platte River downstream of Chatfield Dam; and

WHEREAS, in conjunction with said downstream improvements, the Corps has designated approximately 640 acres of land, lying on either side of the South Platte River between Colorado State Highway 470 on the south and the southern boundary of the Town of Columbine Valley on the north, as being within the "erosion limits" of the South Platte River and which is to be acquired for flood control and recreational purposes; and

WHEREAS, Littleton under the provisions of the AGREEMENT BETWEEN THE COLORADO WATER CONSERVATION BOARD, A DIVISION OF THE DEPARTMENT OF NATURAL RESOURCES, STATE OF COLORADO, AND THE CITY OF LITTLETON, COLORADO, entered into on the 13th day of October, 1977, shall acquire, maintain and operate said land within the "erosion limits" for flood control and recreational purposes; and

WHEREAS, Cooley owns certain real property interests within said "erosion limits" on which are located certain improvements owned by Cooley and associated with existing sand and gravel extraction and processing operations being conducted on adjacent property by Cooley; and

WHEREAS, in order to secure title to the land owned by

Cooley, and in consideration of financial and other factors, Littleton must make acquisition of said Cooley property conditional upon successful fulfillment of the terms and conditions of a separate agreement by and between Littleton and CENCO Land Company, et al, dated the 11th day of March, 1982; and

WHEREAS, the parties to this Agreement are desirous of reducing to writing the proposal for the conveyance of certain land to Littleton by Cooley in exchange for continued extraction and processing of mineral rights including the continued use of the property and improvements described herein, and other good and valuable considerations.

NOW THEREFORE, in consideration of the mutual covenants contained herein, the parties covenant and agree as follows:

1. Littleton shall acquire from Cooley that certain real property consisting of 5.655 acres, more or less, (hereinafter "the Property") as further described in Exhibit "C" (which is attached hereto and made a part hereof by this reference) for Eight Thousand Five Hundred Thirty Dollars (\$8,530.00) and other considerations hereinafter set forth.

2. Cooley shall convey to Littleton by General Warranty Deed the Property described in Exhibit "C", which is attached hereto and made a part hereof, together with all easements and rights-of-way appurtenant thereto. Title to the property to be transferred above shall be merchantable to the transferor and shall be free and clear of all liens, encumbrances, and taxes. Closing shall occur concurrently with the closing on land to be acquired by Littleton from CENCO, et al, which closing date is stipulated in that certain agreement by and between Littleton and CENCO, et al, dated the 11th day of March, 1982.

3. Littleton shall grant Cooley the right to

continue operation of the truck scales, scale house and access through the Property, described in Exhibit "A" hereof. Such operation shall terminate and all improvements shall be removed from the premises, at Cooley's expense, at the end of a period concluding twelve (12) years from the date of closing or upon conclusion of adjacent mining operations whichever occurs first. Said operation shall conform to the present geographical limits and permit conditions of Cooley's current Mining and Reclamation Permit.

4. Cooley is and shall be permitted by Littleton, for as long as Cooley's plant is in operation, to use the lake on the Olsen property, described in Exhibit "G" which is attached hereto and made a part hereof, for purposes of a fresh water supply and settling basin.

5. Littleton agrees to reasonably protect Cooley's two existing NPDES points and access thereto.

6. Cooley is and shall be granted by Littleton access to the Olsen property, more fully described in Exhibit "G" which is attached hereto and made a part hereof, for the purpose of completing reclamation of the west side as described in Exhibit "G".

7. Cooley is and shall be granted by Littleton the right to remove, from a pile on the east side of the Olsen property, a reasonable quantity of dirt for the purposes of reclamation.

8. Littleton agrees to assume responsibility for all reclamation activity remaining for the east side of the Olsen property pursuant to and as required by the Mined Land Reclamation Permit issued therefor by the State of Colorado to Cooley; Littleton further agrees to promptly notify the Mined Land Reclamation Board of its assumption hereunder.

9. Littleton agrees that the terms and conditions of the agreement by and between Littleton and CENCO, et al,

dated the 11th day of March, 1982, regarding annexation, zoning, disconnection and access shall apply equally to the acquisition of the Cooley property described herein.

10. This Agreement is entered into as a compromise and settlement in lieu of Littleton filing a petition in eminent domain on the Property.

11. The representations, warranties, covenants and agreements of the parties in this Agreement and in connection with the closing of the transactions contemplated hereby, shall survive the closing or closings required herein.

12. For all property conveyed by deed under this Agreement, general taxes of 1982 shall be apportioned to date of delivery of deed based on the most recent levy and most recent assessment. All other fees and assessments including but not limited to water rents and sewer rents shall be apportioned to date of delivery of deed.

13. Possession of the real property transferred herein by deed or lease shall be delivered to Littleton at the time of closing preserving however those rights accruing to Cooley pursuant to paragraph 3 above.

14. Any and all prior agreements between the parties hereto with respect to the subject matter of this Agreement are hereby cancelled and terminated. No amendments to this Agreement shall be made other than by a written amendment signed by all the parties.

15. This Agreement is made and entered into in the State of Colorado, and shall in all ways be governed and construed by the laws of such State. If any provision of this Agreement be adjudicated invalid or against public policy for any reason by a Court of competent jurisdiction, it is specifically intended that each and every provision not so invalidated shall remain in full force and effect.

16. This Agreement shall be binding upon the parties hereto, their heirs, successors, administrators, executors and assigns, and the parties hereto do covenant and agree that they themselves and their heirs, executors, administrators and assigns will execute any and all instruments, releases, assignments and consents that may be required of them in accordance with the provisions of this Agreement.


17. No waiver of any provision of this Agreement shall be construed to be a waiver of any subsequent breach of the same or any other provision of this Agreement.

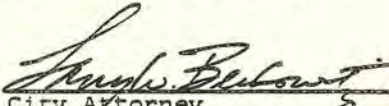
CITY OF LITTLETON

By 

COUNCIL PRESIDENT

ATTEST:


Sandra Lee Day
Deputy City Clerk
APPROVED AS TO FORM:



Joseph Belmont
City Attorney

COOLEY GRAVEL COMPANY,

By 

PRESIDENT

ATTEST:


Marlene H. Hepp

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