

Cooley Lake Area Management Plan

2006 (Revised 2009)

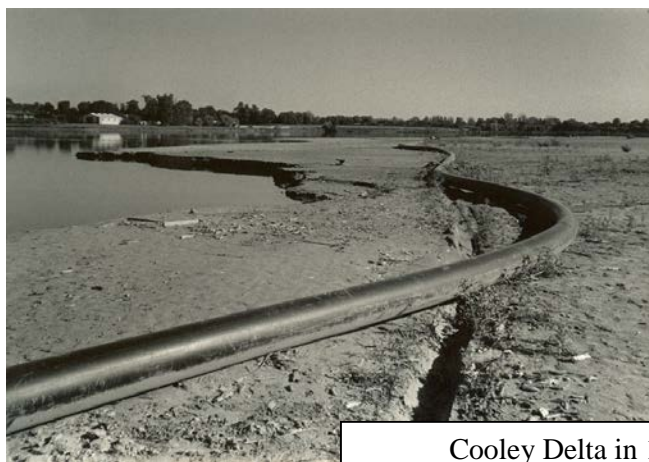
Cooley Lake is currently managed as a restricted access zone in the Park, meaning the public may visit the area only on staff-guided activities or projects. The management decision was controversial and continues to be reviewed on a regular basis. Overall, the policy has successfully created space for wildlife in an increasingly loved and well-used Park. The Cooley Area shows greater wildlife diversity than other regions of the Park, and creates a very special and unique experience in the heart of Littleton for people who take advantage of the free monthly public hikes to visit the lake.

Why Is Access Restricted?

Cooley Lake is not completely closed, but rather public access is restricted to ranger-guided activities. This provides control on the amount, type of use, and timing around the lake to help the area function as a refuge for wildlife. Cooley Lake is not open to unguided visitation. Before the area was a park, it was a privately-maintained gravel mine. When mining operations ended in 1989 and Cooley was added to the park, it remained closed for a mandatory 5 year reclamation period. After the reclamation process was completed, public meetings were held to decide the use of the area. Based on resource analysis and public input, the current policy was adopted. The objectives for South Platte Park include maintaining a naturally functioning native floodplain ecosystem, as well as providing public recreation. Sometimes, these two objectives are not always compatible and the Cooley Area offsets significant recreation impacts near the Nature Center and on the regional Greenway Trail.

Who Can Visit the Lake?

Currently the area is managed so that the Lake receives up to 3 public-groups per month. The Lake is open to everyone on a free hike on the 2nd Sunday of every month, and one Saturday per quarter. The Nature Center registers interested visitors for no charge, but does limit each hike to two groups of 15 visitors each for the optimum viewing experience. Volunteers or staff lead the 1.5 hour hikes.



Cooley Delta in 1989 and again in 2006

Organized groups are excluded from this opportunity, as the hikes are offered to provide general public access to a restricted area, not to provide free programming. Groups with a specific

interest in the area may request a program in Cooley, but may still be charged fees to cover the costs of a guide. Groups granted access with volunteer guides have included Denver Field Ornithologists, Audubon groups, Tuesday Birders, and local high school ecology and biology clubs.

Additionally, during the summer months, a fee-based sunset canoeing program (one of the Park's most popular) is offered once per month. Finally, the public may gain access to the area by participating on one of the many resource volunteer projects in the area such as restoration plantings, weed control projects, watering, cattail elimination projects, nest-box monitoring, and winter waterfowl or breeding bird counts.

If it is a reclaimed gravel mine, can it really be valuable for wildlife?

While the area is by no means a pristine wilderness or natural landscape, it does serve as important wildlife habitat by providing food, water, shelter, and most importantly space where animals can raise their young and live without continuous stress from humans. The species used to re-vegetate the area are native to the South Platte River Valley, and most wildlife using the area are natives. The space component has proven effective to attract and maintain species not found in more frequently visited areas of the Park.

Why do animals need space?

Animals spend a lot of energy moving away from people and dogs to feel they are at a safe, comfortable distance. The wildlife reserve area provides a place where they can focus on feeding, resting, or raising their young with a minimum of human-induced stress. By preserving a portion of the park as a natural wildlife area, it allows visitors to keep seeing wildlife on the rest of the park. When you want to escape stress, you can go sit quietly in your house and lock your door. Wildlife doesn't have that option, without some type of refuge. If the entire Park is opened to visitation, it loses the balance of use and becomes a lower quality habitat for wildlife.

What impacts do people have?

People moving around the lake regularly surround animals with activity, flush them from their loafing areas on the shoreline, and alter their behaviors.

- Animals on the move burn critical energy needed for migration or breeding activities.
- Social trails form around the exterior of the lake (as seen around all existing lakes open to regular visitation). This leads to destruction of wetland and riparian vegetation, nesting and feeding areas separated from the safety of the water, occasionally even young separated from parents.
- Ground nesting ducks and willow- and cattail-nesting songbirds often have their nests disturbed or damaged by anglers.
- Anglers leave significant amounts of litter debris—lakes currently open to regular public use are visited at least once per month for litter cleanup, with multiple bags collected each time. Litter has entangled and killed wildlife at these lakes.
- Lakes open to fishing or partially open to fishing require additional patrol, license checks, and boundary enforcement. The majority of alcohol and trespass violations in the park are anglers.
- Animals escaping from humans are distracted, thus more susceptible to predation from other animals. They are also pushed off prime feeding grounds.

- Human activity restricts the roosting activities of raptors such as osprey and bald eagles that currently use Cooley more frequently than other lakes.

It's public land, why can't I go there any time I want?

Public lands are managed for the desires of all the people, as well as for the health of the resources. Because of this, decisions are made about use and access. A good analogy is that the Post Office is a public entity, yet there are places you can't wander in on your own. The Post Office operates more efficiently and serves the public better with restricted access. Some natural areas operate best this way as well. The park provides many opportunities for people, but its primary mission is to maintain the area as a natural floodplain. Additional goals include restoring native species, providing educational opportunities, and providing limited recreational opportunities. The Cooley wildlife area helps the Park meet the first three parts of the mission that is not met in parts of the Park where recreation opportunities are prevalent.

Why isn't fishing allowed?

The park currently has 5 lakes and the entire length of the river (or 62,370 feet of river banks and lakeshores) available for fishing and which are stocked regularly. To balance visitor use with the resource needs, a public decision process created the policy to keep fishing out of the Cooley area, which is approximately 25% of the available shoreline. Cooley Lake is not stocked by the Division of Wildlife, nor was it ever stocked. While some game fish may have found their way into the lake, the last study revealed most of the fish are carp and white suckers.

Why is South Platte Reservoir Restricted?

The new South Platte Reservoir opened in 2007. It is owned by Centennial Water and Sanitation, not Littleton. It is included in Park boundaries to create a "buffer" from other developments and allow some public use of the reservoir, which would otherwise not be authorized without our Rangers to patrol it. The new reservoir is storage for drinking water supply. Because of this, there is limited body contact by humans and dogs. Centennial has been requested to allow programmed use of the reservoir for canoe and kayak programs and perhaps sailing courses where body contact is limited.

It is not an equivalent exchange to open Cooley to full use when this reservoir comes on-line, as the Reservoir provides very little significant wildlife habitat.

- The Reservoir has a square perimeter with steep 3-to-1 slope providing very little usable shoreline for wildlife. This doesn't compare to the hidden bays, islands, beaver structures, and shallow marsh edges that create variety on the shore of Cooley.
- The Reservoir will have no shelter for small fish and invertebrates like that provided by submerged trees in Cooley, thus would have limited food supply for birds.
- The Reservoir will have rocky shores with no riparian or wetland vegetation that are needed for loafing or nesting areas.
- The Reservoir could drain over a very short period when users demand water, and could sit entirely empty for years. Cooley receives water directly through the river alluvium thus should never dry up nor fluctuate greatly.

Cooley Lake Special Sightings

In the last 10 years, the following birds have been reported ONLY from the Cooley Lake area of the Park:

Least Tern	Great-tailed Grackle
Black Tern	Chimney Swift
Black-legged Kittiwake	Mew Gull
Great-crested Flycatcher	Canada Warbler
Tundra Swan	Sage Sparrow
Yellow-bellied Sapsucker	Blackpoll Warbler
Pacific Loon	Red-breasted Merganser
Semi-palmated Sandpiper	

Additionally, many birds are seen regularly in the Cooley area, and only rarely in other parts of the park:

Bald Eagle	Marsh Wren
Osprey	Green Heron
Snow Goose	Western Grebe (fledging chicks)
Ross's Goose	Clark's Grebe
Ruddy Duck	Horned Grebe
Canvasback	Eared Grebe
White Pelican	White-faced Ibis
Greater White-fronted Goose	Franklin's Gull
Common Loon	Bonaparte's Gull
American Avocet	Rose-Breasted Grosbeak
Black-necked Stilt	Common Nighthawks
Long-billed Dowitcher	

Cooley is also home to the largest and most active coyote den known in the Park.

Annually it is home to at least 1 and up to 3 active beaver families.

The area has hosted black bears on 2 recent visits to the Park over the past few years, and is the only place where "unusually large cat-like tracks" were found just days before a young mountain lion was killed by the light-rail train near Mineral in 2006.

The broad expanse of cattails on the delta region shelters swallows by the hundreds during inclement weather after they have left their nests on bridges in the area, but before they leave for migration. This was a discovery unique to that area of the Park, and the birds are easily disturbed by human presence.

Habitat Enhancement Projects in the Cooley Area:

- Near complete elimination of noxious weeds including knapweed, thistles, spurge, purple loosestrife, Russian olives, common buckthorn, and tamarisk.
- Managing grassland areas using prescribed burns and mechanical action to mimic prairie conditions (wildfires and bison herd movement)

- Removal of Russian olive trees, sinking the trees in concrete and putting in water to create reef and shelter structures for fish, aquatic insects, and amphibians (food base for larger animals)
- Seeding with native prairie wildflowers —diversity in plants (especially non-grasses) attracts diversity in insects which in turn attracts diversity in birds and mammals.
- Shoreline erosion control—placing logs perpendicular to prevailing winds to absorb wave energy and trap sediments and create beaches, shallow shoreline and herbaceous wetlands

FACT SHEET

Cooley Lake Area Management Plan

2007

History

The Cooley Lake Area was previously a privately-maintained gravel mine. In 1989, it was incorporated into South Platte Park but it remained closed for a mandatory 5 year reclamation period. After the reclamation process was completed, public meetings were held to decide the use of the area which is 236 acres and 26% of the Park. The goals for South Platte Park include (1) maintaining a naturally functioning native floodplain ecosystem, (2) managing the resources as a natural ecosystem, as well as (3) providing regional educational opportunities and (4) providing limited leisure opportunities. These goals are not always compatible with each other in the Park. In order to achieve balance between them, the low use of the Cooley Area offsets significant recreation impacts near the Nature Center and on the regional Greenway Trail. Based on resource analysis and public input, the current restricted access policy was adopted. The public decision process also created the policy to keep fishing out of the Cooley area.

Resource Management

The Cooley Area shows greater wildlife diversity than other regions of the Park. This cohesive and undisturbed area is important wildlife habitat which provides food, water, shelter, and space where animals can raise their young and live without continuous stress from humans. The Cooley Lake Area attracts and maintains species not found in more frequently visited areas of the Park (listed on Supplemental). By preserving a portion of the park as a natural wildlife area, it allows visitors to keep seeing wildlife on the rest of the park. If the entire Park is opened to visitation, it loses the balance of use and becomes overall a lower quality habitat for wildlife.

The addition of South Platte Reservoir to the Park does not greatly increase or replicate the unique variety of wildlife habitats found in the Cooley Lake Area. The Reservoir is a water storage facility that could sit empty for years during a drought. It is managed to maximize drinking water safety and taste. Therefore, no fish or plants will be introduced to it. The non-vegetated shoreline doesn't have hidden bays, islands, beaver structures, and shallow marsh edges that create variety and habitat on the shore of Cooley. The reservoir may serve to attract occasional waterbirds on migration, but without a sustainable food chain, it will not be able to replace Cooley as prime habitat for wildlife.

Public Impacts and Access

Natural areas heavily frequented by human visitation have lower wildlife habitat qualities. Social trails around the exterior of lakes lead to destruction of wetland and riparian vegetation. Ground nesting ducks and willow- and cattail-nesting songbirds often have their nests disturbed or damaged by anglers. Lakes open to fishing require additional patrol, license checks, and boundary enforcement. South Platte Park currently has 5 other lakes and 2.5 miles of river (or 11.8 miles of river banks and lakeshores) available for fishing and regular stocking. Animals in these areas escaping from human disturbance are distracted, thus more susceptible to predation from other animals. They are also pushed off prime feeding and breeding grounds.

Therefore, Cooley Lake is a limited access zone where the public may visit the area on staff-guided activities, free monthly public hikes, fee-based programs, or volunteer projects. This provides control on the amount, type of use, and timing around the lake to help the area function as a refuge for wildlife.

The City Council, SSPR Board, and managers' decision to provide limited access to the Cooley Lake Area maintains a balance between the Park's goal of preserving a natural ecosystem and the goal of providing education and leisure opportunities in a heavily use natural area.

Fact Sheet - Supplemental

Cooley Lake Diversity Data

A monthly Winter Waterfowl Census is conducted in the Park November through March annually since 1991. Over the 16 years that this study has been conducted, Cooley Lake has recorded 25% more species than Lake 2, the most comparable lake in the Park (55 species, compared to 44 species). Of those species, 14 have never been reported during the census from Lake 2, while only 3 species from Lake 2 were not found at Cooley. Cooley also had very high numbers of herons, mergansers, and coots compared to Lake 2. This data is taken from sunrise until approximately 9:30 am, before most human activities occur in the Park. Staff has observed that most wildlife vacate the area as human activity increases during the day.

Annual spring and fall bird migration counts are conducted in South Platte Park. Based on migratory count data collected since 2000, Cooley Lake Area has on average 9.6% more species of birds (44-71 species) than did all of the five lakes south of Mineral combined (37-54 species) with the exception of one count where the number of species observed was identical. The number of individual birds seen at Cooley (514-3185 individuals) was on average 23% more than that observed at all five Lakes south of Mineral (301-854 individuals).

In the last 10 years, the following birds have been reported ONLY from the Cooley Lake area of the Park:

Least Tern	Yellow-bellied Sapsucker	Mew Gull
Black Tern	Pacific Loon	Canada Warbler
Black-legged Kittiwake	Semi-palmated Sandpiper	Sage Sparrow
Great-crested Flycatcher	Great-tailed Grackle	Blackpoll Warbler
Tundra Swan	Chimney Swift	Red-breasted Merganser

Additionally, many birds are seen regularly in the Cooley area, and only rarely in other parts of the park:

Bald Eagle	Common Loon	Clark's Grebe
Osprey	American Avocet	Horned Grebe
Snow Goose	Black-necked Stilt	Eared Grebe
Ross's Goose	Long-billed Dowitcher	White-faced Ibis
Ruddy Duck	Marsh Wren	Franklin's Gull
Canvasback	Green Heron	Bonaparte's Gull
White Pelican	Western Grebe (fledging chicks)	Rose-Breasted Grosbeak
Greater White-fronted Goose		Common Nighthawks

Raptors, such as osprey and bald eagles, currently use Cooley for roosting activities more frequently than other lakes.

Cooley is home to an active coyote den.

Annually it is home to at least 1 and up to 3 beaver families.

The area has hosted black bears on two visits to the Park in the past, and is the only place where "unusually large cat-like tracks" were found just days before a young mountain lion was killed by the light-rail train near Mineral in 2006.

The broad expanse of cattails on the delta region shelters swallows by the hundreds overnight and during inclement weather after they have left their nests on bridges in the area, but before they leave for migration. This was a discovery unique to that area of the Park, and the birds are easily disturbed by human presence.

ADDENDUM

Impact Assessment for Open-Public, Recreational Access to Cooley Lake Wildlife Area

May 2009

Cecily H. Y. Mui, Resource Specialist

Purpose of the Assessment

Members of the Littleton City Council requested in October 2008 a study of impacts and cost for open-public access to Cooley Lake Wildlife Area. A focal point of the study is to determine the impacts and cost to opening Cooley Lake for fishing. Another key point in discussions leading to the request of this study is philosophical and political positions for public access to tax-funded lands and for management of natural public resources. This point will also be addressed in this assessment, primarily in the discussion on natural resource impacts and costs.

Present Use and Access

In 1994, after several public meetings, Littleton City Council voted to restrict public access to Cooley Lake with the exception of naturalist-guided walks/programs or approved studies. Simultaneously, this created the policy to not allow fishing in Cooley Lake.

Cooley Lake Area is a designated Wildlife Area. According to the South Platte Park (SPP) Management Plan (Resource Management, Land Management Plan, Wildlife Areas, p. 12), wildlife areas are “those areas documented through studies and observations of primary importance in providing habitat (food, water, shelter, and space) for a diversity of plants and animals... Recreational activities in these areas are limited to official park programs and passive activities.” Cooley Lake Area is documented to harbor abundant and unique biodiversity. As stated in the above Fact Sheet Supplemental (2007) which details Cooley Lake Diversity Data, Cooley Lake consistently demonstrates more bird species than other lakes in the park and species that are uncommon and rare for the area. Birds, which are comparatively easier to monitor than other wildlife, are indicators of habitat quality and vegetative communities. Characteristics unique to the Cooley Lake Area that may contribute to its greater diversity relative to other areas in SPP are its large size, cattail “delta,” and limited human disturbance to wildlife.

Limited passive recreation provides the public with opportunities to visit the Cooley Lake Area as detailed in the above Cooley Lake Area Management Plan, Who Can Visit the Lake, 2006. Naturalist-guided hikes are provided free of charge to the public once a month. Guided hikes ensure protection to the natural resource, provide an observant naturalist to point out wildlife that is not often noticed by the public, and develop added awareness through discussions for the natural heritage preserved by government agencies for the public and future generations. In 1994-1998, guided hikes were offered weekly; however, due to low attendance of 27-130 people/year, hikes were changed to monthly events. Interestingly, attendance then increased to 153-273 people/year (176 people in 2008). Hikes rarely reach the 15-25 participant capacity, except for once or twice a year when there is a greater interest for special family activities on holidays, such as Easter and Mother’s Day. Public demand for this use does not appear to exceed availability. Other public offerings include registered, organized group hikes and fee-based educational and canoeing programs. Additionally, volunteers and service groups are provided special land stewardship, wildlife monitoring, and educational opportunities to contribute to the preservation and restoration of natural resources in the Cooley Lake Area. Public comments collected in the Suggestion Box at the Carson Nature Center have not received any requests for open access to the Cooley Lake Area.

Present maintenance activities in the Cooley Lake Wildlife Area are: weed control, native plant re-seeding, lakeshore-wave erosion control, fire-break mowing along property boundary, shrub and tree planting, tree wrapping, and wetland culvert drainage systems. Routine maintenance in the Cooley Lake Area is minimal relative to other areas of unrestricted public access within SPP. Trail maintenance and clearance, fence repair, litter pick-up, trash removal, patrolling, dogs off-leash, sign maintenance, vandalism, and soil erosion, denuding, and weed problems from overuse, do not occur in the Cooley Lake Area.

Proposed Changes to Recreational Uses

The impact and cost study requested by Littleton City Council is for fishing in Cooley Lake. Trails will also be assessed as there will be a need to properly guide users through and/or around sensitive habitat. This assessment of land management and recreational use change is based on the assumption that there is a demand from the public for fishing access to Cooley Lake and a potential change in views on the protection of natural public resources. However, as stated previously, such a demand has not been received from visitors to the Carson Nature Center. Similarly, Denver Trout Unlimited collaborated with SPP to install fishing survey boxes in June 2008. To date, out of 52 completed surveys, there are no requests for public fishing in Cooley Lake (which is not currently stocked).

Base Infrastructure Cost

The following is a cost estimate of base infrastructure development in the Cooley Lake Area in order to open it to hiking and fishing. This base cost is to provide safe and adequate user access and to protect sensitive habitats. This cost will not vary between different lengths and seasons of open public fishing scenarios. Trail creation would be a minimal cost if existing service roads are used. The highest cost is fencing to secure sensitive vegetative communities and wildlife habitat. The cost estimate presented below (Table 1) does not include trail improvements such as, engineering re-design and construction for pedestrian crossing at the future Normandy Gulch tie-in to Cooley Lake or stream-crossing at the Cooley Lake outflow to the South Platte River. Map 1 shows some of the potential infrastructure needs.

Table 1. Estimated base infrastructure cost for opening Cooley Lake Area to public trail and fishing access.

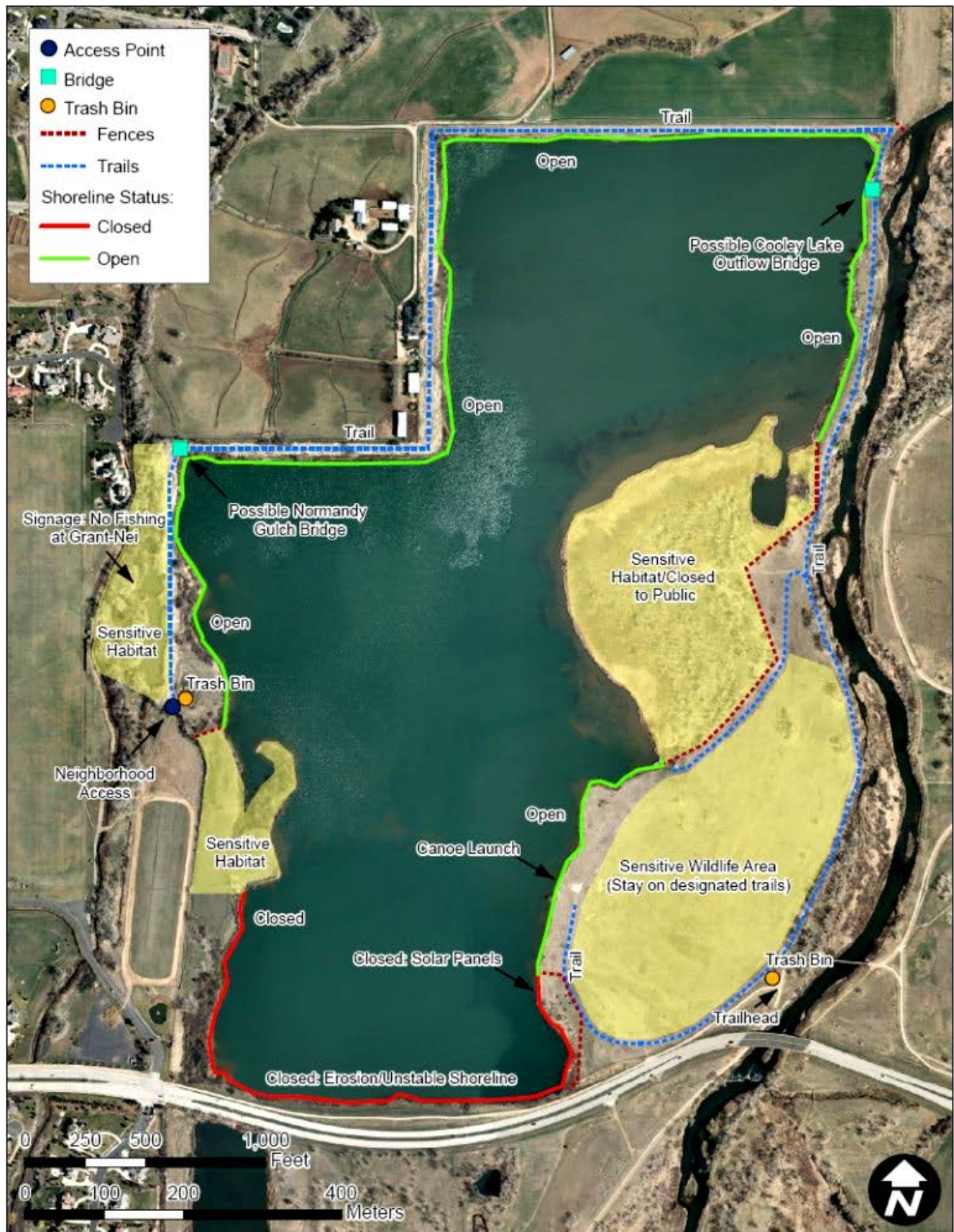
	<u>Quantity</u>	<u>Cost/Labor</u>
Trail	11,665 ft	\$90
Fence	2,617 ft	\$7,150
Trash bin	4	\$350
Signage	12	\$300
Trailhead	1	\$100
Total Cost:		\$7,990*†

*Cost excludes permits, engineering, design, and construction (estimated \$76,000-\$100,000) of vehicle-rated bridge over the Cooley Lake outflow stream to the South Platte River.

†Cost does not include Normandy Gulch pedestrian and vehicle crossing bridge.

If visitation to South Platte Park increases due to new users drawn to the proposed Cooley Lake recreation, parking problems may be compounded in the already limited Carson Nature Center parking lot.

Map 1. Potential base infrastructure for opening Cooley Lake to public fishing



Potential On-going Maintenance Cost

Eight open-public fishing scenarios are assessed: 1 day/year, 1 day/month, 1 day/week, weekend only, 1 week/month, seasonal opening when disturbance to wildlife is minimized, daily with permits, and unrestricted daily access.

In the **1 day/year** and **1 day/month** scenarios, impacts on wildlife would most likely be minimal should staff determined closures be permitted when rare and protected wildlife sensitive to human disturbance are found utilizing the area, such as nesting raptors. However, development cost might not justify such minimal use.

The **1 day/week**, **weekend only**, and **1 week/month** scenarios would have moderate to high impacts on wildlife and vegetation. Wildlife sensitive to human disturbance will have the opportunity to forage and rest in the area on the days when it is closed to public access. However, wildlife activities which require a longer consecutive length of time without disturbance, such as reproduction, will likely suffer. To minimize human disturbance, staff and volunteer should time maintenance projects in the Cooley Lake Area to occur on public access days.

Seasonal opening when disturbance to wildlife is minimized is unrealistic. There is not a period in the year when this secluded habitat is not important to wildlife. From mid-February to late August, resident and migratory birds nest in the area. From August through September, birds are utilizing the area in fall migration; the foothills and transition zone to the plains are important along the trans-continental migratory routes. From October through March, wintering waterfowl seek refuge in aquatic habitats foraging for food and resting to conserve fat reserves to survive periods of inclement weather. Wintering waterfowl are also involved in important courtship and pair-bonding breeding behaviors. From November to late February, bald eagles (state-threatened status) are wintering, foraging, and potentially seeking nesting habitat in the area. Regular opening of the Cooley Lake Area to public access at any point in the year will impact these and other wildlife activities. The decision for an imposed period of seasonal opening will be a decision to sacrifice habitat for corresponding wildlife activities.

Daily access with registration and no-cost permits issued from the Carson Nature Center and **unrestricted daily access** will have wildlife impacts identical to those stated under seasonal opening. Daily access with registration and permits differs from unrestricted access in that: 1) there is a designated number of anglers per day based on available fishing shoreline to minimize crowding and shoreline degradation, 2) fishing is only available Tuesday to Sunday when the nature center is open, 3) anglers sign an agreement for understanding of boundaries, fishing regulations, leave no-trace, park rules and regulations; violations may limit future permits, and 4) trespassing restricts future permits.

Table 2 provides an on-going, annual, maintenance cost/labor for Cooley Lake opening to fishing within each scenario. These cost/labor estimates are beyond the present routine-maintenance cost occurring in the area with limited public access. Material cost is highest for lakeshore erosion control, weed management, and native vegetation seeding/planting. There will be a larger demand on time and labor (Table 2) should Cooley Lake Area be opened for fishing. Present staffing of Resource and Rangers does not account for the proposed increase level of land and visitor management.

Table 2. Additional annual maintenance cost and labor for open public access to fishing at Cooley Lake in eight access scenarios.*

	1 day/ year	1 day/ month	1 day/ week	Weekend Only	1 week/ month	Seasonal Opening	Daily with Permit	Unrestricted Daily
Trail maintenance	\$120	\$250	\$250	\$250	\$250	\$120	\$250	\$250
Hazardous tree removal	\$400	\$400	\$600	\$600	\$600	\$400	\$600	\$600
Fence repair	\$72	\$72	\$72	\$72	\$72	\$72	\$72	\$72
Litter pick-up	\$50	\$120	\$180	\$180	\$120	\$180	\$180	\$180
Trash removal	\$15	\$180	\$390	\$500	\$390	\$390	\$500	\$500
Ranger patrol	\$60	\$720	\$2880	\$2964	\$1440	\$680	\$5852	\$6840
Sign maintenance	\$20	\$20	\$40	\$40	\$40	\$20	\$40	\$40
Lakeshore erosion	\$50	\$50	\$200	\$200	\$200	\$200	\$400	\$400
Weed control	\$50	\$50	\$175	\$175	\$175	\$350	\$350	\$350
Vegetation seeding/planting	\$50	\$50	\$100	\$100	\$100	\$200	\$200	\$200
Total Cost/Labor:	\$887	\$1,912	\$4,887	\$5,081	\$3,387	\$2,612	\$8,444	\$9,432

*Labor is estimated at \$15-\$19 per hour.

If frequent, open public access is offered, South Platte Park may eliminate the free, naturalist-guided hikes, which is a stipulation of restricted-access to the Cooley Lake Area. South Suburban Parks & Recreation (SSPR) could charge \$5 to \$9 per participant (depending on residency) to recuperate cost of guided-hike programs.

Natural Resource Impacts and Costs

Any of the proposed recreational changes to the present Wildlife Area will negatively impact wildlife diversity and numbers. Various scientific studies (Boyle and Samson 1985, Erwin 1989, Cassierer et al. 1992, Holmes et al. 1993, Miller 1994, Miller et al. 1998, Reed and Merenlender 2008) have found that wildlife (mammals and birds) species, sensitive to disturbance, decrease in population and nesting along recreational trails. Miller et al. (1998) found that nest predation was greater along recreational trails. A literature review by Miller et al. (1998) lists flight distance, which is the distance from disturbance/disturber to animal when the animal physically flees to a safer location, to range from 15 meters to 400 meters. Taylor and Knight (2003) utilized calculations of the area around existing trails in a state park that may be impacted by recreationists on trails to demonstrate the area that could be rendered unsuitable for wildlife. Should similar methods be implemented in the Cooley Lake Area, results would likely show a significant loss in suitable dryland and aquatic habitat. Disturbance to wildlife affects their ability to forage, rest, and reproduce; increases energy expenditure; and impacts their survival.

The creation of social trails for fishing along the shoreline results in trampled vegetation that may be rare, increase in weeds favoring disturbance, changes in soil structure, erosion, and soil compaction. While resource managers will design trails to minimize disturbance to sensitive habitat, such as the grassland between the gate access along the Mary Carter Greenway Trail and

the immediate eastern shore of Cooley Lake, users may create informal trails for a more direct route to desired destinations.

In 2008, members of the SSPR Board of Directors questioned the validity of citizen science (programs of scientific data collection by volunteers in tasks such as observations, measurements, or computations) in SPP's bird monitoring programs (Cooley Lake Area Management Plan, Fact Sheet-Supplemental, 2007). They also asked for more information on the biodiversity of taxa of wildlife and vegetation which SPP staff and volunteers do not monitor. Park staff submitted to the SSPR Board and City Council in fall 2007 a budget estimate for a potential study to assess biodiversity differences in the Cooley Lake Area to similar habitat in the park that has open access to the public. A budget estimate of \$7,000 for a minimum of two years was submitted but was not funded.

The monetary, economical value of wildlife is complicated and controversial (Stevens et al. 1991, Nunes and van den Bergh 2001). Wildlife can be valued for its "use," such as hunting, fishing, and viewing; it can also be valued for its "existence," such as intrinsic right to exist, future use, and endowment to future generations. Monetary value can be assessed more readily for protected species when there is a need, such as, to rehabilitate, reintroduce, enforce area closure, acquire/restore habitat, or to pay fines. However, monetary value is difficult to quantify for unprotected species. Similarly, ecological functions are difficult to value. These functions may be relatively simple to calculate such as, rectifying causes and damages of erosion or pollutants in water. Yet how should values be placed on the decrease or loss of an item in the food chain or the loss of a keystone species which changes the fundamentals of an ecosystem (e.g., mountain pine beetles damaging pines in a pine forest)? Rather than put a monetary value on wildlife loss due to open public access to the Cooley Lake Wildlife Area, I present several examples of social value of wildlife relevant to this Cooley Lake recreational assessment for policy-making consideration:

- Ability to fish any and all desired water bodies on public land
- Importance of passive recreation, such as, hiking in the Cooley Lake Area at the public's convenience
- Opportunities for passive recreationists to observe wildlife in the Cooley Lake Area with minimal impacts to wildlife (Satisfied with present naturalist-guided hikes and not see need for additional access)
- Opportunities for the public to observe uncommon and rare wildlife as they pass through existing publicly accessible areas, as these wildlife enter the Cooley Lake Area for limited resources
- Assurance of secured public lands that meets wildlife survival needs (reproduction, shelter, food, water, rest)
- Habitat protection and enhancement for wildlife, especially rare species
- Comfort of knowing that species can exist in its natural habitat range
- Protection of natural resources from degradation
- Protection of natural resource for present and future generations

Within and adjacent to Littleton, SSPR manages 3,797 acres of parks and open space which offer open-access to the public. South Platte Park's restricted Cooley Lake Wildlife Area (236 acres) is less than 6.2% of that total. Providing fishing in the Cooley Lake Area will change its land use and recreational activity zone from Low Activity Zone/Natural Area to a Moderate Activity Zone (South Platte Park Management Plan, Figure 13, 2009), thus eliminating lakes with natural shorelines within all Low Activity Zone/Natural Area.

Numerous communities and natural-area parks have elected to not permit public access to all of their open space lands. Public access is prohibited to whole properties such as, Pine Cliff Ranch and Woodhouse State Wildlife Area in Douglas County and Fossil Creek Reservoir in the City of Fort Collins. Wildlife protection areas closed to the public within accessible open space occur in places such as, Mesa Reservoir in the City of Boulder, Indian Lookout Mountain in Boulder County, Roxborough State Park in Douglas County, and Lair o'the Bear in Jefferson County.

Recommendation

The preferred management recommendation is to maintain the Cooley Lake Area as a Wildlife Area due its unique and rare natural resources and limited large areas of natural area in riparian and aquatic habitat without human disturbance in the region. Should open-public access for fishing be permitted, minimize the number of open-access days, minimize long periods of sustained disturbance, and provide longer, consecutive lengths of closure, especially during periods of wildlife reproduction, migration, and protected species use. Restrict dog, bicycle, and horse access. Allow for SSPR staff to make reasonable temporary closure decisions when uncommon and rare species are utilizing the area for activities such as, reproduction.

Literature Citation

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