Draft Resource Management Plan and Environmental Assessment

Horsetooth Reservoir
Carter Lake
Pinewood Reservoir
Flatiron Reservoir

Larimer County, Colorado

U.S. Department of the Interior
Bureau of Reclamation

Larimer County
Department of Natural Resources

June 2017

Mission Statements

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

The mission of the Larimer County Natural Resource Department is to establish, protect and manage significant regional parks and open lands providing quality outdoor recreational opportunities and stewardship of natural resource values. We are committed to fostering a sense of community and appreciation for the natural and agricultural heritage of Larimer County for present and future generations.

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Flatiron Reservoir

Larimer County, Colorado

prepared by

Logan Simpson
123 North College Avenue, Suite 206
Fort Collins, Colorado 80524

for

U.S. Department of Interior
Bureau of Reclamation
11056 W. County Road 18E
Loveland, Colorado 80537

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How to Comment on this Draft RMP/EA

This document contains the Resource Management Plan (RMP) and associated Environmental Assessment (EA) for four U.S. Department of the Interior Bureau of Reclamation (Reclamation) reservoirs constructed under the Colorado-Big Thompson Project (C-BT Project) and subsequently managed for recreation by Larimer County Department of Natural Resources (Larimer County): Horsetooth Reservoir, Carter Lake, Pinewood Reservoir, and Flatiron Reservoir.

Reviewers should provide Reclamation with their comments during the review period of the draft RMP/EA. This will enable Reclamation to analyze and respond to the comments at one time. Comments on the evaluation of the impacts of the No Action and Proposed Action will help decision makers determine whether to issue a Finding of No Significant Impact (FONSI) or to prepare an environmental impact statement (EIS). Comments on the draft RMP/EA should be specific and should address the adequacy of the assessment and the merits of the alternatives discussed (40 Code of Federal Regulations 1503.3).

Written comments can be provided online at https://www.usbr.gov/gp/ecao/nepa/reservoir_parks_mp_comment.html, by e-mail or regular mail. E-mail should be addressed to the attention of Mr. Patrick McCusker at pmccusker@usbr.gov. Regular mail or Fax should be sent to the following address:

Patrick McCusker, Natural Resource Specialist
Bureau of Reclamation
11056 W. County Road 18 E
Loveland, CO 80537
Fax: 970-663-3212

Media inquiries or general questions about Reclamation and the RMP/EA should be directed to James Bishop at (970) 962-4326 or jbishop@usbr.gov.

Other information about the concurrent planning efforts Reclamation is conducting with its partner, Larimer County, is available at www.onegreatcountytoplay.com.

Abbreviations and Acronyms

ABA	Architectural Barriers Act
ADA	Americans with Disabilities Act
Admin Building	Natural Resources Administrative Building
ANS	Aquatic Nuisance Species
APE	Area of Potential Effects
ARPA	Archeological Resources Protection Act of 1979
BLM	Bureau of Land Management
C-BT Project	Colorado – Big Thompson Project
CIP	Capital Improvement/Replacement Plan
CNAP	Colorado Natural Areas Program
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks & Wildlife
CR	County Road
CSFS	Colorado State Forest Service
CSU	Colorado State University
EA	Environmental Assessment
ECAO	Eastern Colorado Area Office
EO	Executive Order
FONSI	Finding of No Significant Impact
GOCO	Great Outdoors Colorado
IPaC	Information for Planning and Conservation
ITAs	Indian Trust Assets
Larimer County	Larimer County Department of Natural Resources
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NISP	Northern Integrated Supply Project
Northern Water	Northern Colorado Water Conservancy District
NRHP	National Register of Historic Places
PAB	Larimer County Parks Advisory Board
PCA	Potential Conservation Areas
PFYC	Potential Fossil Yield Classification
PRPA	Paleontological Resources Protection Act
Reclamation	U.S. Department of the Interior Bureau of Reclamation
RMP	Resource Management Plan
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Officer
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

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Chapter 1 — Introduction

This document contains the Resource Management Plan (RMP) and associated Environmental Assessment (EA) for four U.S. Department of the Interior Bureau of Reclamation (Reclamation) reservoirs constructed under the Colorado-Big Thompson Project (C-BT Project) and subsequently managed for recreation by Larimer County Department of Natural Resources (Larimer County): Horsetooth Reservoir, Carter Lake, Pinewood Reservoir, and Flatiron Reservoir. These reservoirs and surrounding lands are collectively referred to in this document as the four reservoirs or as the project area. Given that much of the same information and analysis required for an EA is also included in an RMP, the two documents are combined.

The RMP/EA describes the management framework; needs, opportunities, and constraints; public issues and concerns; Reclamation and Larimer County goals and objectives; and specific management objectives and actions for the four reservoirs. The RMP/EA also provides a history and baseline for measuring the progress and success of proposed management actions. Lastly, it provides an implementation plan to monitor the effectiveness of management actions and progress toward a desired condition.

The RMP/EA was prepared according to current Reclamation guidelines (2012 National Environmental Policy Act (NEPA) Handbook) and the Council on Environmental Quality regulations in compliance with NEPA. It provides an evaluation of the impacts of the No Action and Proposed Action and is intended to help decision makers determine whether to issue a Finding of No Significant Impact (FONSI) or to prepare an environmental impact statement (EIS).

Existing resource conditions and environmental factors are described, along with the potential effects of the alternatives on these resources and environmental factors. The resources and environmental factors analyzed in the EA include natural resources (hydrology and water quality; geology, soils, and topography; vegetation and fire management; and fish and wildlife), visitor experience (recreation, visual, land use, public facilities and transportation), socioeconomics, cultural resources (including paleontological resources), and other resources.

This integrated RMP/EA updates and supersedes the previous RMP/EA document (June 2007).

1.1 Scope and Organization of the Resource Management Plan/Environmental Assessment

The RMP/EA provides a framework for the protection, enhancement, and management of the natural, cultural, and recreation resources at the four reservoirs. The following summary of chapters briefly describes the scope of the RMP/EA:

Chapter 1: Introduction

Chapter 1 provides an introduction to and overview of the four reservoirs and states the purpose and need for the RMP/EA, overall objectives, and consultation and coordination efforts. Chapter 1 also establishes the management and policy framework by describing the existing land uses at

the four reservoirs, adjacent land uses, and the policies and programs influencing the use of federal land and water areas.

Chapter 2: Planning Process

Chapter 2 summarizes the key factors that influenced the development of the RMP/EA by identifying planning issues, opportunities, constraints, and describes the scoping and public involvement process.

Chapter 3: Alternatives

Chapter 3 describes the RMP, which has been identified as Reclamation's Proposed Action. This chapter details the management directives, goals, and objectives for the four reservoirs for the next 10 years. This Chapter also describes Reclamation's No Action Alternative. The No Action Alternative would continue management of natural, cultural, and recreation resources under the existing 2007 RMP.

Chapter 4: Affected Environment and Environmental Consequences

Chapter 4 describes the affected environment (existing conditions) at each of the four reservoirs and discusses the expected environmental consequences of implementing the Proposed Action alternative. Existing conditions and potential effects are organized per reservoir. This Chapter also addresses potential cumulative effects and mitigation.

Chapter 5: RMP Implementation Procedures

Chapter 5 outlines the steps necessary to implement the RMP. Chapter 5 incorporates appropriate other environmental commitments needed to protect the human environment and support Reclamation's FONSI for the Proposed Action, as well as an implementation schedule.

Chapter 6: Consultation and Coordination

Chapter 6 includes a description of consultation and coordination with appropriate federal, state, and local government agencies, as well as the public. This chapter also includes a list of individuals who assisted in the preparation of the RMP/EA.

1.2 Project Location/Project Area

The four reservoirs are located in the foothills west of the cities of Fort Collins and Loveland, Colorado (Figure 1.1). The project area is defined as the public lands and water within the boundaries of the four reservoirs. In general, these reservoirs are subject to the same weather patterns and all support similar types of wildlife and vegetation. However, variations in topography, elevation, aspect, and level of development on adjacent lands result in characteristics unique to each reservoir. The two largest reservoirs, Horsetooth Reservoir and Carter Lake, support a full range of water and land based recreation. Pinewood and Flatiron reservoirs are smaller and provide fewer recreational opportunities. Swimming is prohibited at Pinewood and Flatiron reservoirs and no boating is allowed at Flatiron Reservoir. Boating at Pinewood Reservoir is restricted to wakeless speeds.Water levels fluctuate seasonally at Carter

Lake and Horsetooth Reservoir, while fluctuations at Pinewood and Flatiron reservoirs occur on a daily basis.

1.2.1 Horsetooth Reservoir

Horsetooth Reservoir is located in the foothills just west of the City of Fort Collins, Colorado. It maintains a normal pool elevation of 5,413 feet. The reservoir was created in a narrow valley between two ridges, resulting in a linear water body approximately 6.5 miles long with a north-south orientation. At most locations the reservoir is less than 0.5 mile wide, but a series of coves on the west side add additional width. These coves also add variety to the reservoir shoreline and provide protected areas that are highly valued for boating and other recreational activities, as well as for wildlife habitat.

Horsetooth Reservoir was constructed to provide terminal storage for the C-BT Project. Water flows into Inlet Bay via the Charles Hansen Supply Canal. At normal high water, the reservoir occupies approximately 2,040 surface acres and stores approximately 156,735 acre-feet of water. Federally owned land associated with the reservoir includes approximately 1,725 acres, resulting in a management area of nearly 4,000 acres.

1.2.2 Carter Lake

Carter Lake is located approximately 8 miles west of the City of Loveland, Colorado at an elevation of 5,749 feet. The reservoir lies in a natural basin between a series of hogback ridges oriented north-south. The reservoir extends approximately 3 miles from north to south and varies between 3,000-4,000 feet in width. Carter Lake has a fairly regular shoreline and has a normal high water surface area of 1,144 acres and stores approximately 112,228 acre-feet of water. Combined, the land and water surface areas are approximately 2,218 acres.

Carter Lake was constructed to provide terminal storage for the C-BT Project. Water is pumped uphill to Carter Lake from Flatiron Reservoir via a pressure tunnel that terminates in the northwest corner of the lake. Water stored in Carter Lake is used for agricultural, domestic, municipal, and industrial purposes and is delivered to users via the St. Vrain Canal.

1.2.3 Pinewood Reservoir

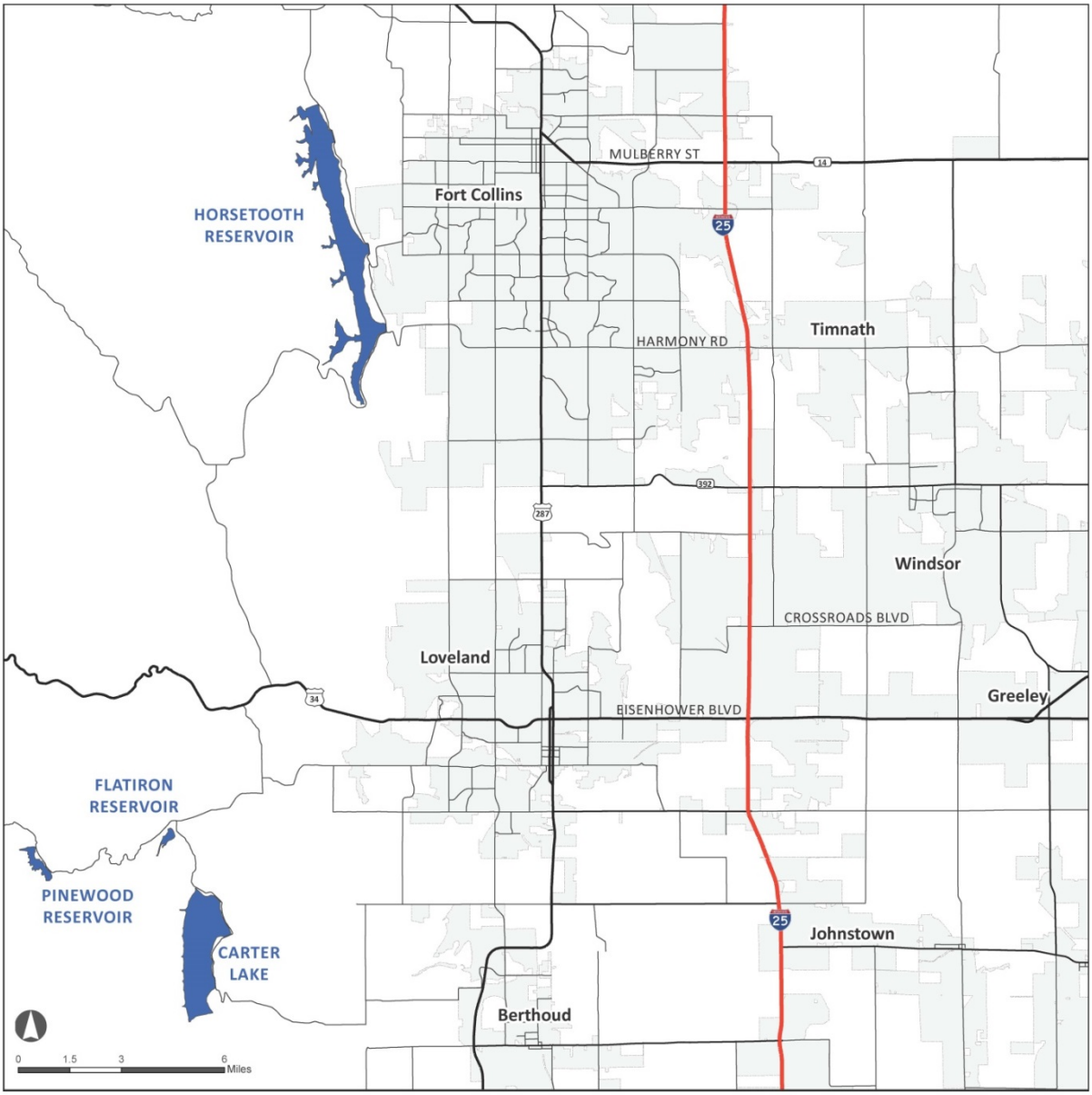
Pinewood Reservoir is a small reservoir located in Rattlesnake Park approximately 12 miles southwest of Loveland, Colorado. Pinewood Reservoir has a length of approximately 4,400 feet and the average width of the reservoir is approximately 800 feet. Pinewood Reservoir has a surface area of 97 acres. Federally owned, publicly accessible land around Pinewood Reservoir comprises approximately 141 acres. Pinewood Reservoir serves as a forebay for the C-BT Project's Flatiron Powerplant.

1.2.4 Flatiron Reservoir

Flatiron Reservoir is located at the base of Flatiron Mountain approximately 8 miles west of Loveland, Colorado. The reservoir serves as an afterbay for the C-BT Project's Flatiron Powerplant and also as a forebay for a pumped storage unit. In addition, Flatiron Reservoir is the distribution point from which C-BT Project water can be diverted either to the north or south into

other C-BT Project facilities, including Horsetooth Reservoir and Carter Lake. These facilities are also owned and operated by Reclamation. Flatiron Reservoir is the smallest of the four reservoirs and has a total storage capacity of 722 acre-feet and a surface area of 44 acres. The main body of the reservoir is approximately 2,200 feet long and the width varies from 600 to 1,200 feet. Federally owned land surrounding Flatiron Reservoir combined with the water surface area totals 390 acres.

Figure 1.1 Project Location Map



1.3 Proposed Federal Action

The preparation and implementation of a RMP is a federal action that is intended to direct the management of resources at the four reservoirs in order to maximize overall public and resource benefits for the next 10 years. NEPA requires federal agencies to consider the potential impacts of federal actions on the environment before implementing project alternatives. Therefore, a planning process and an appropriate level of environmental analysis were used to develop this RMP/EA. This RMP/EA will be used as the management framework for the four reservoirs and surrounding lands until 2027.

1.3.1 Purpose and Need

The purpose of this RMP/EA is to establish a long-term plan detailing a framework to provide decision makers with consistent direction and guidance for successful resource and recreation management of Reclamation lands and water surface. The RMP would also establish resource management goals, objectives, and management actions. The previous RMP was completed in 2007. The laws authorizing Reclamation to prepare and revise RMPs can be found under the Federal Water Project Recreation Act of 1965, Public Law 89-72; Reclamation Recreation Management Act of 1992, Public Law 102-575, and United States Code Title 28.

Reclamation is directed to "provide for the development, use, conservation, enhancement, and management of resources on Reclamation lands." The need for this RMP revision is to address increasing impacts to existing infrastructure and resources by providing a guide for future developments. Other needs include maximizing recreational benefits, minimizing resource conflicts, and protecting resources on Reclamation lands.

Addressing emerging issues and reaching a balance between management for visitor recreation use and management of natural resources is a challenge. Over the last 10 years since the 2007 RMP was prepared, recreation trends and demands have changed, resulting in new or changed management issues. Population growth in Colorado and Larimer County has grown substantially and is projected to continue to grow at a substantial rate (DOLA. 2016a). In Larimer County alone, the population is predicted to grow by 150,000 by 2040; the equivalent of adding another Fort Collins. This growth has resulted in increased visitation and impacted existing infrastructure, recreation sites, and resources. Some new recreational uses have also developed, resulting in demand for new facilities and increased user conflicts. The concern for management of invasive species, both aquatic and terrestrial, has also increased.

Nationwide, recreation use of available sites has increased and is expected to continue to increase. This growth in use is a reflection of the "baby boomer" generation reaching retirement age, increased leisure time overall, new recreation technologies, and increased public awareness of recreational opportunities. Nationwide trends show increasing public demands for water-based outdoor recreation facilities and opportunities. According to the 2014 Colorado Statewide Comprehensive Outdoor Recreation Plan (SCORP), water-based recreation activities are increasing in popularity nationwide. In 2011, Americans participated in boating at the rate of 17.8 percent, making it one of the most popular activities nationwide (State of Colorado 2014). A 2016 Physical Activity Council Report shows that millennials participate in more water sports than other generations, which can include boardsailing/windsurfing, canoeing, kayaking, jet

skiing, rafting, sailing, scuba diving, snorkeling, stand-up paddling, surfing, wakeboarding, and water skiing (Physical Activity Council 2016).

A 2014 study of Federal Outdoor Recreation Trends conducted by the National Center for Natural Resources Economic Research shows that motorized water use has the highest participation rate of all motorized activities. More than 80 million adults or 27 percent of the adult population are projected to participate in motorized water use in 2030, a 30 percent increase from 2008 (National 2014).

The four reservoirs and surrounding lands have become important resources for the rapidly growing communities along Colorado's Front Range. Increasing regional demand reflects population growth and the continuing popularity of water-based recreation. Together, these factors have led to conflicts, impacts, and resource issues, as well as providing substantial benefits to recreation users, local communities, and regional economies. Regionally, a shortage of water-based recreation facilities currently exists (Larimer County 2017). Yet the potential for development of additional recreation facilities at the four reservoirs is limited by terrain, and the majority of suitable recreation sites have already been developed and are in use.

Current issues and needs have been identified by Reclamation and Larimer County through a comprehensive public and stakeholder involvement process. The RMP/EA addresses issues and needs relating to:

- Visitor experience, including safety, diversified experiences, recreational opportunities, and improved facilities.
- Natural resources.
- Socioeconomics and cultural resources.
- Administration, including fiscal responsibility.

The RMP/EA addresses these issues and enables Reclamation and Larimer County to make appropriate management decisions; coordinate allocation of funds; plan and implement projects; and to effectively meet the current and future recreational demands of visitors and county residents.

1.4 Resource Management Planning Objectives

The purpose of the RMP is to establish a 10-year plan that defines the management framework for the conservation, protection, and enhancement of the four reservoirs. The RMP will guide Reclamation, along with Larimer County and other participating agencies, in managing, allocating, and appropriately using the federal land and other resources at the four reservoirs while protecting the authorized C-BT Project purposes and natural resources.

A RMP is a comprehensive planning document that identifies goals and objectives for land use and resource management, specifies desired future land and resource conditions, and explains the policies and actions that will be implemented during the life of the plan.

The RMP is needed to do the following:

- Ensure that management of the natural and recreational resources is compatible with authorized C-BT Project purposes.
- Provide decision makers with consistent direction and guidance to successfully manage resources and project facilities at the four reservoirs.
- Address the increasing demand for public use of the resources at the four reservoirs, while protecting and enhancing the natural and recreational resources.
- Serve as a management tool for Reclamation and Larimer County, as well as other possible managing agencies, by outlining resources, policies, and actions that will guide decisions over the 10-year life of the plan.

The RMP provides a coordinated plan for managing, protecting, and enhancing the wildlife habitat, natural resources, and recreational resources and is consistent with the mission and goals identified in Reclamation's Strategic Plan.

Reclamation's Strategic Plan goals include the following:

- Manage, develop, and protect water and related resources to help meet the needs of current and future generations.
- Operate, maintain, and rehabilitate facilities safely, reliably, and efficiently to provide benefits.
- Advance Reclamation's organizational effectiveness.

Larimer County has similarly identified the following broad management goals:

- Balance natural resource protection with recreational opportunities given future demand.
- Provide a diversity of safe and appropriate recreation experiences.
- Ensure financial sustainability.

The RMP/EA identifies specific strategies to accomplish these goals.

1.5 Management Framework

Administration of the federal land and water areas at the four reservoirs requires a coordinated effort between multiple entities with varying degrees of management responsibility. The purpose of this section is to describe the management framework and the existing policies and responsibilities of the agencies involved. Reclamation has an obligation to coordinate its planning activities with adjacent private and public landowners to ensure that authorized uses of its lands are compatible with adjacent land uses. Reclamation is the lead agency charged with preparing the RMP and associated EA. Title 28, Section 2805, of Public Law (PL) 102-575 (106 Statute [Stat.] 4690, Reclamation Recreation Management Act of October 30, 1992) provides Reclamation with authority to prepare RMPs.

Other government agencies with resource management responsibilities are also participating in the RMP process. These agencies include the Northern Colorado Water Conservancy District (Northern Water), Colorado Parks and Wildlife (CPW), the U.S. Army Corps of Engineers (USACE), and other government agencies with specific interest and expertise listed below and in Chapter 6.

1.5.1 Management Responsibilities

Bureau of Reclamation

Reclamation maintains primary jurisdiction of the federal lands and water at the four reservoirs and has overall responsibility for environmental resources. However, as explained later in this chapter, some specific resources, such as the fishery, are the responsibility of other agencies. Nevertheless, Reclamation administers all use authorizations for federal land and water areas at its four reservoirs. In providing proper stewardship of public lands, Reclamation is responsible for implementing and complying with all federal laws, regulations, and executive orders (EOs), such as NEPA; C-BT Project authorizing legislation (Senate Document 80); the Endangered Species Act; National Historic Preservation Act (NHPA); Archeological Resource Protection Act (ARPA); Paleontological Resources Preservation Act (PRPA); Fish and Wildlife Coordination Act; EOs 11644 and 11989, Off-Road Vehicles; EO 11889, Floodplains; EO 11990, Wetlands Protection; EO 12962, Recreational Fisheries; EO 13007, Sacred Sites; and EO 13186, Conservation of Migratory Birds. As such, Reclamation has ultimate responsibility for protecting and managing most of the resources at the four reservoirs.

Reclamation authorizes and manages concessions on its lands pursuant to Reclamation's manuals and *Directives and Standards: Concessions Management by Non-Federal Partners*. Reclamation and any managing partners will ensure that concessions are developed and managed to meet public needs, protect natural and cultural resources, and provide stewardship of all lands and waters, as well as to provide a variety of goods and services to the public while being consistent with authorized C-BT Project purposes.

Larimer County

On June 18, 1954, Larimer County under license with Reclamation, assumed the responsibility of administering Reclamation's four reservoirs for public recreational purposes. The 1965 Federal Water Project Recreation Act (PL 89-72) provided for the planning, land acquisition, and development of the recreational potential at existing water development projects. The law was later amended to allow for federal cost-sharing of up to one-half the cost of this planning, as well as operations, maintenance, and replacement (PL 102-575, Title 28, Section 2804). These funds depend on implementation of a current RMP and satisfaction of NEPA requirements. In 1997, the original 1954 recreation agreement between Reclamation and Larimer County was replaced with Memorandum of Understanding (MOU) No. 97-AG-60-09220 giving Larimer County the responsibility to administer lands and facilities at the four reservoirs for public recreation purposes. The MOU is for a period of 25 years and is renewable for an additional 25 years upon request by Larimer County. The total length of the MOU will not exceed 50 years, at which time it shall be renegotiated at the consent of both parties.

The overarching Larimer County vision is to add value to the lives of county citizens by building partnerships, being customer driven, promoting innovation, empowering people to take responsibility, being a fulfilling and enjoyable place to work, and being a good steward of public resources. The Larimer County Department of Natural Resources is responsible for managing recreational use at the four reservoirs.

In November 1995, the citizens of Larimer County, Colorado voted to approve a quarter-cent (1/4 percent) sales and use tax to protect open space, natural areas, wildlife habitat, regional parks, and trails. This tax has been extended, most recently in 2014, and remains in effect through 2043. A portion of the sales tax is available for recreation enhancements and new facilities at these four existing reservoir properties as well as land acquisitions county-wide.

Program operations at the four reservoirs are primarily funded through Larimer County-generated revenue, including permit fees collected from visitors (covering approximately 94 percent of operational expenses). Most of these user fees are generated at the four reservoirs and all of these funds are required to be used for operation, maintenance, or improvement projects at the four reservoirs. Larimer County also receives some grant funding, as well as General Fund dollars, to cover the remaining operational expenses at the four reservoirs. General funds are used for programs that lack a sufficient revenue stream from recreation use fees, etc., to meet operating expenses.

Reclamation has authority to match up to 50 percent of capital improvement costs for certain recreation planning and development at the four reservoirs that are identified in the RMP. These funds are appropriated through the Reclamation Recreation Management Act of 1992. Annual funding allocations vary significantly, depending on federal budget appropriations. Larimer County's share of capital improvement costs comes from the Colorado Lottery, Great Outdoors Colorado (GOCO) and other grants, and the sales tax.

Northern Colorado Water Conservancy District: Water Supply

Under the terms of Contract No. 9-07-70-W0020, (dated July 5, 1938, as amended and supplemented) ("Repayment Contract") with the United States of America, Northern Water is responsible for operating and maintaining the C-BT Project water supply delivery facilities including Carter Lake and Horsetooth Reservoir. The majority of water stored in the four reservoirs is used for municipal or agricultural uses. Depending on supply and demand within the system, optimal water levels for recreational activities are not always available.

Colorado Parks and Wildlife

CPW is responsible for fisheries management, which includes stocking the four reservoirs for fishing opportunities. Monitoring of fish populations for stocking purposes occurs on an unplanned, as-needed basis. CPW and Larimer County staff patrol the four reservoirs to enforce fishing regulations and creel limits. CPW oversees the management and viability of fish and wildlife populations within the State of Colorado, including all Reclamation lands and waters. CPW is also responsible for developing standards and support for protecting the waters of Colorado from infestation by aquatic nuisance species (ANS).

Law Enforcement

The Larimer County's Department of Natural Resources, along with the Larimer County Sheriff's Department, enforces federal, state, and local laws on Reclamation lands. Some of the Larimer County's Department of Natural Resources rangers are deputized and have authority to enforce state and local laws. Rangers also enforce Larimer County's Title 29 regulations. The Sheriff's Department also regularly patrols the dams and facilities at each of Reclamation's four reservoirs for security purposes.

Fire Management

Pursuant to the Secretary of the Interior's policy letter dated January 18, 2001, Reclamation is required to address the implementation actions contained in the updated 2001 Federal Wildland Fire Management Policy document. The 2001 Wildland Fire Management Policy states that every area with burnable vegetation must have an approved Fire Management Plan. These are strategic plans that define a program to manage wildland and prescribed fires based on the area's approved land management plan. Fire Management Plans must provide for firefighter and public safety; must include fire management strategies, tactics, and alternatives; must address values to be protected and public health issues; and must be consistent with resource management objectives, activities of the area, and environmental laws and regulations.

Fire management is provided through a reciprocal multiagency agreement between Larimer County, U.S. Forest Service, Colorado State Forest and others. The agreement provides for cost-sharing and common, annually updated Fire Management Plans.

1.5.2 Adjacent Land Use

Lory State Park is located adjacent to and west of Horsetooth Reservoir. There are no formal agreements or MOUs between Reclamation and Lory State Park; however, Reclamation and Larimer County regularly consult with Lory State Park managers when proposed activities could affect Lory State Park lands or visitation and vice versa. There is a permit agreement between Lory State Park and Larimer County to allow trail users to pass from Horsetooth Reservoir to Lory, and vice versa, with the pass of the area they originated in via hiking/biking/equestrian trails or boat access. Most lands adjacent to the four reservoirs are privately owned and used primarily for residential purposes. There are also several Larimer County owned and managed open spaces adjacent to or near the four reservoirs, such as Chimney Hollow, Ramsay-Shockey, and Horsetooth Mountain open spaces. The City of Fort Collins Natural Areas Department has several properties adjacent to Horsetooth Reservoir, including Maxwell, Reservoir Ridge, and Pineridge natural areas. These natural areas serve as important conservation and recreational corridors between the City of Fort Collins and the foothills.

1.5.3 Related Actions and Activities

Under MOU No. 97-AG-60-09220 with Larimer County, Larimer County has the right to issue and administer various licenses, leases, permits and contracts with private and civic groups for public recreation purposes at the four reservoirs. At Horsetooth Reservoir and Carter Lake, Larimer County maintains permit agreements with the Sail and Saddle Club and Carter Lake Sail Club. These agreements stipulate the permissible uses and permit costs and duration and allow the lessees to control access to some facilities to club members and their guests only.

After a rigorous application and approval process, special-use permits are issued to various recreational, civic, and private groups for short-term events by Larimer County. Special uses include weddings and private celebrations; organized sporting events, such as rowing, sailing, swimming, or fishing contests; and group events or regularly scheduled outings, such as the Boy Scouts of America annual jamboree or the Fort Collins Rowing Association activities.

Concessions at the four reservoirs include the Horsetooth and Carter Lake marinas and a variety of short-term concession agreements, such as those held by fishing guides, sailing schools, and scuba companies. Before issuing or renewing a non-federal concession contract, the contract must be approved by Reclamation (Reclamation Manual, Directives, and Standards LND 04-02, Paragraph 5(A) (2), Contract Approval).

1.6 Project History and Uses

The C-BT Project is the largest trans-mountain diversion project in Colorado, providing supplemental water to 30 cities and towns and 640,000 acres of irrigated farmland in northeastern Colorado. The C-BT Project consists of a series of reservoirs on both sides of the Continental Divide and an extensive network of tunnels, canals, and other ancillary facilities. Together, these project features enable up to 260,000 acre-feet of water to be delivered to northeastern Colorado for agricultural, municipal, and industrial uses. The four reservoirs—Horsetooth, Carter, Pinewood, and Flatiron —are key elements of the C-BT Project system. They store water delivered from the Colorado River basin and also support hydroelectric power production through a system that captures the energy of the imported water flowing down the eastern slope of the Rocky Mountains.

The initial C-BT Project was authorized by Congress on August 9, 1937. Construction of the first elements began in 1938, but the completion of key elements of the system was delayed by the onset of World War II. The first C-BT Project water was delivered to the East Slope in 1947, 10 years after work began on the C-BT Project. Reclamation delivers C-BT Project water to Northern Water, a public agency created in 1937 to distribute C-BT Project water to irrigators and municipalities in northeastern Colorado.

The initial authorization to construct the four reservoirs for irrigation and hydroelectric purposes did not include provisions to construct, operate, or maintain recreation facilities. However, recreational use began soon after construction was completed. On June 18, 1954, the Larimer County Parks District was formed, and Larimer County under an agreement with Reclamation assumed the responsibility of managing Horsetooth, Carter, Pinewood, and Flatiron reservoirs for recreational purposes that continues to this day.

1.7 Agency Consultation and Coordination

All changes, new developments, and other work initiated under the terms of this RMP will be completed in full compliance with all applicable state and federal regulations. Options and alternatives for addressing Reclamation's and Larimer County's needs will be evaluated in terms of their effects on the biological, physical, and socioeconomic components of the natural and human environment.

Information pertaining to the present and future uses of adjacent lands was solicited from the following entities:

- Northern Water
- CPW
- Colorado State University Research Foundation, Real Estate

- City of Fort Collins Natural Areas Department
- Larimer County Community Development Department
- Larimer County Sheriff's Department
- Local Fire and EMS Providers
- Colorado Natural Heritage Program
- Colorado State Forest Service
- City of Fort Collins Utilities Department

Chapter 2 — Planning and Scoping Process

2.1 Introduction

This chapter describes the key factors that have influenced the development of this RMP/EA. Reclamation land use planning focuses on resolving issues concerning the use and management of public lands and resources while providing opportunities for future use and demands.

2.2 Planning Process

An established planning process was used for the preparation of the RMP/EA to determine issues, opportunities and constraints (Figure 2.1). The planning process for this RMP/EA was conducted consistent with NEPA and Reclamation guidelines. A parallel effort to update Larimer County's Parks Master Plan also took place. The Parks Master Plan will address financing issues and additional needs in the county that are beyond the scope of the RMP/EA. The two plans were integrated in order to be cognizant of people's time and realize the efficiency of a joint planning effort.

2.3 Plan Development

Reclamation has the primary stewardship responsibility to manage the lands under its jurisdiction in accordance with existing laws, policies, and guidelines. In cases in which Reclamation lands are directly managed by others, such as through the MOU with Larimer County, Reclamation exercises oversight responsibility to ensure that the managing agency fulfills its responsibilities pursuant to the terms and conditions of the management agreement between the parties. Key objectives include protecting fish, wildlife, and biodiversity; preserving the environmental resources and cultural values of historical places; providing for outdoor recreation; and protecting the health and safety of visitors. These objectives, as well as management actions, must be met in an environmentally and economically sound manner.

A primary step in the planning process was to identify goals and policies to address issues and opportunities. Many of the goals, policies, and actions were formulated in response to Reclamation land management principles, concepts and policy. Pursuant to NEPA requirements, potential effects of implementing certain combinations of actions (i.e., "alternatives" or management plans) were analyzed and the results are disclosed in subsequent chapters of this RMP/EA.

2.4 Issue Identification

The issues identified reflect a broad range of observed issues and opportunities associated with management and operation of the four reservoirs (see Section 2.6). The issues contributed to development of the RMP, including its goals and policies and plan recommendations.

Figure 2.1 RMP/EA Planning Process

The issues and opportunities were identified through consultation with a variety of individuals and agency representatives, including those who attended the two public meetings on the RMP, and expert knowledge expressed by members of the Planning Team as described below.

A Planning Team was formed to address management strategies, issues and opportunities. The team included representatives from Reclamation, Larimer County, and the project consultant. The Planning Team was responsible for gathering public input and guiding the direction and scope of the RMP/EA.

A Technical Advisory Committee was also formed to provide input on the development of the RMP/EA. This group primarily consisted of key federal, state and local agencies, including CPW, Northern Water, Fort Collins Natural Areas, and various other departments in Larimer County.

Following the 2007 RMP/EA, Larimer County Board of County Commissioners created a Parks Advisory Board (PAB). The PAB members represent a range of park and recreation, natural resource, and community interests, as well as geographic areas throughout Larimer County. The PAB provided input during scoping and alternatives development.

Along with the general public, multiple stakeholder groups were represented during the public process including, but not limited to, neighbors, rowing/boating/fishing clubs, mountain bike/equestrian/climbing groups, and concessionaires.

A list of Planning Team members, agencies, partners, stakeholder groups and other involved persons is provided in Chapter 6.0.

2.5 Public Events and Timeline

The public was asked for input during three phases of the planning process; public scoping, alternatives development and review of the draft RMP/EA. Each phase involved multiple public meetings with the public along with Stakeholder and Technical Advisory Committee meetings, and meetings with other key stakeholders.

The Reclamation website provided project updates, meeting notifications and meeting materials. Larimer County also hosted a website with project information. The public was notified of meetings through both Reclamation and Larimer County press releases, direct mailings, and Larimer County's e-newsletter.

A complete summary of public input from scoping is documented in the "Public Scoping Report" for the Larimer County Parks Master Plan and Resource Management Plan/Environmental Assessment (Reclamation 2016).

2.5.1 Internal Scoping

Interviews were held with the Technical Advisory and Stakeholder committees, concessionaries, user groups and government organizations to solicit comments about the management of the four reservoirs. Stakeholder interviews included a diversity of user groups including motorized boaters, anglers, climbers, paddleboarders, campers, hikers, mountain bikers, equestrians, etc.

2.5.2 Public Scoping

The scoping process extended over a 45-day period (July 7 - September 9, 2016) and provided an opportunity for the public to identify issues, opportunities, constraints, and ideas for managing resources and recreation use at the four reservoirs. Three meetings were held: one at Horsetooth Reservoir (South Bay Group Pavilion), one near Carter Lake (Larimer County Natural Resources Administration Office), and one at The Ranch Events Complex (near I-25 and Crossroads Boulevard). In total, over 140 people attended the meetings.

Each meeting was conducted in an open-house format that included a series of exhibits about the RMP/EA process, along with a summary of input received to date on each reservoir. Meeting participants were encouraged to discuss their issues and questions with representatives from Reclamation and Larimer County.

Larimer County also administered an online questionnaire during the scoping period. Comments are summarized in the next section, Section 2.6 Scoping Issues and Opportunities.

2.5.3 Alternatives Development and Analysis

Following initial public and stakeholder input, concepts were developed for improvements to several recreation areas at the four reservoirs. The concepts were reviewed by the public during a 30-day review period (November 4 - December 3, 2016) and public meetings were held in Fort Collins and Loveland. A total of 93 participants attended the public meetings on alternatives. Hard copy and online questionnaires were provided that requested the public to review the alternative concepts and provide feedback on facilities provided, site layouts, and other content. A total of 744 people responded to the questionnaire.

2.5.4 Public Review of the Draft RMP/EA

Comments on this draft RMP/EA will be accepted for a 60 day review period. Substantive comments received during the review period will be addressed in the final document.

2.6 Scoping Issues and Opportunities

The scoping process provided an opportunity for early input on determining the scope of the issues to be addressed by the plan. Many topics were identified during scoping, ranging from management issues to new uses and impacts on land and water resources.

The following key resource topics and issues were identified by the public, the Technical Advisory and Stakeholder committees, and the Planning Team. The key resource topics are grouped into Natural Resources and Visitor Experience categories with corresponding comments and issues summarized below.

2.6.1 Natural Resources

Hydrology and Water Quality

Maintaining suitable water quality while allowing motorized boating and other water-based recreation is critical to supplying and satisfying water customers and supporting healthy fish populations and aquatic habitat.

Quality of the Fishery

The four reservoirs provide habitat for a variety of fish species, which creates important recreational opportunities. Maintaining and improving aquatic habitat is key to a healthy fish population. Overuse of the resource and the impacts it has on the fishing experience was an identified concern.

Natural Resource Conditions

The protection and enhancement of vegetation and wildlife health is critical, particularly in light of anticipated increases in the number of visitors to the four reservoirs. Concerns about harassment of wildlife were identified along with the need for better trail maintenance.

Weed Control

Impacts on native plant communities, wildlife habitat, and natural resources caused by weeds are of concern on the land surrounding the four reservoirs. The public should be better educated about weeds through signage. Volunteers, including students, could be recruited to assist with weed-control efforts.

Aquatic Nuisance Species

A number of comments were received concerning improving the efficiency of screening for ANS. In addition, funding provided to CPW through severance tax proceeds was recently terminated. The need for additional funding sources remains acute. However, it is not a topic that can be addressed in this RMP/EA.

2.6.2 Visitor Experience

Recreation & Safety

Recreation is an important use of the four reservoirs and an important aspect of the Colorado lifestyle. Maintaining quality recreational experiences is a vital consideration in future management of the reservoirs. Education about on-water safety rules (including paddleboard/boat/rowing etiquette) and a strong ranger presence are essential elements of providing a safe recreational experience. Conflict between motorized and non-motorized users of the reservoirs is a documented concern. Most conflicts seem to occur on the water, given that non-motorized watercraft, such as stand-up paddleboards or kayaks, and power boats, share the same areas. Concerns with the turbulence caused by power boats, interference of non-motorized watercraft in motorized areas, and noise/exhaust complaints are among the most frequent responses. Boat ramps are the second-highest area of conflict between these two user groups, mostly due to safety concerns. The ability of rangers to patrol the area at night is another critical aspect of keeping the public safe when they are recreating.

Availability of Facilities

The majority of comments regarding facilities referenced specific sites at any one of the four reservoirs. These comments are summarized in the next section, Section 2.6.3 Site Specific Comments by Reservoir. A major challenge is balancing the demand for increased number of trails, campgrounds and facilities with desires to maintain the natural setting and resource protection.

Crowding

Visitor crowding and the need for different activity zones is an identified issue. Carrying capacity is the ability of a recreation resource to accommodate a user population at a measurable threshold without the number of users negatively affecting the resource or the visitor experience. Carrying capacity applies to both water and land surface acres. As populations in Larimer County and the region increase, and with most of the recreation areas built out, there will be continued challenges with crowding both on water and land at the four reservoirs.

2.6.3 Site Specific Comments by Reservoir

The following tables (Table 2.1 -Table 2.4) summarize comments heard concerning each reservoir during the public scoping process. The comments are organized by reservoir and then by the location of the recreational facility.

Table 2.1 Horsetooth Reservoir Scoping Meeting Comments

Locations	Public Meeting and Online Comment Summary
Blue Sky Trailhead and Day Use Area (Field of Dreams)	• Add attractions for neighborhood kids, such as a playground, at Blue Sky Trailhead. Plant vegetation to screen views of parking lots.
South Bay Swim Beach and Group Day-Use Improvements	• Improve South Bay swim beaches through better sand and swim access all summer long, especially at high water levels.
South Bay Campground	• South Bay pit toilets should be better maintained to manage strong odors. • No new camping is desired in this area due to the current overuse of the area on weekends. • A food truck presence is requested.
Lower Sunrise Swim Beach	• An improved beach that would be specifically designed for better high-water access, less rocky beach area, and stand-up paddleboard /kayak access is desired at Lower Sunrise. Stairs were suggested to deal with the varying water levels.
Coves and West Shoreline Boat- In Campsites	• Screen the Dixon Cove outhouse by use of natural vegetation. Limit the number of boats parked in Dixon Cove at one time, and prohibit party boats from parking in Dixon Cove.
New Archery Range North of Horsetooth Dam	• Interest in an archery range, a nature trail for visitors of all abilities, or stationary exercise equipment. Perceived safety issues and a belief that the facility would be underutilized are common concerns expressed about the potential archery range.
Lower Sunrise Paddling Sports Facility	• A permanent, land-based rowing boat house is desired to enhance the area high school programs. The facility would expand membership growth, increase participation in rowing, and assist students with obtaining scholarships for collegiate rowing. Security should be improved at the existing rowing dock, potentially by installing a gate to deter trespassers.
Inlet Bay Campground	• Additional campsites were generally opposed by the respondents, due to current overcrowding, excess noise, and air quality concerns. • Quality of life in nearby neighborhoods is feared to decline if more campsites are constructed. Additional campsites, including dredging the reservoir for more campsites, are generally opposed by the respondents, due to current overcrowding, excess noise, and air quality concerns. • Quality of life in nearby neighborhoods is feared to decline if more campsites are constructed. • Purchasing a land easement under the power line (or using the construction

Locations	Public Meeting and Online Comment Summary
	road) was suggested as a way to create a soft-surface trail.
Improved Circulation at Satanka Bay	• Many comments focus on the types of uses in Satanka Cove, ranging from only allowing non-motorized water sports to teaching non-motorized users about proper boating etiquette. More parking (especially trailer parking) is desired, and better parking signage is needed. • Illegal parking along residential roads needs to be controlled.
Climbing Access, The Scoop	• Create access up/down cliff to complete the social trail that currently exists.
South Bay to Inlet Bay Trail Connection	• Soft-surface trail loops around Horsetooth Reservoir, for both hikers and bikers, are desired. Connections to the North and South Bay areas, Lory, and Fort Collins should be added to the network. Nordic track in Inlet Bay could be groomed for winter use. Safer access from Fort Collins to the reservoir via bike is a frequently mentioned concern; suggestions for a separated bike lane, soft-surface trails along CR38E/23, and wider shoulders are all suggested as possible remedies. More soft-surface trail connections should be made around the reservoir, in between the reservoirs, and connecting with adjacent trail systems.

Table 2.2 Carter Lake Scoping Meeting Comments

Locations	Public Meeting and Online Comment Summary
Marina Area	• County needs to control fees and other services available at the pump- out dock; there are frustrations with the current marina owner and a steady increase of fees. • Users are concerned that high fees would result in illegal discharging directly into the lake. • More parking is needed.
Eagle Campground, New Cabins	• The north end needs an RV dump station.
Big Thompson Campground	• Prefer a day-use area that closes at night instead of camping.
New Swim Beach South of Big Thompson Campground	• The existing swim beach is underused due to the lack of shade and an environment that is not appropriate for small children. Another swim area, more shoreline designated areas, and a free day-use area at the quarry are desired. Regulate the limited parking available.
Carter Knolls, New Cabins	• Cabins at Carter Knolls would be preferred due to wind.
North Shoreline, New Trail from Sundance Trail to Marina and New Swim Beach	• A new lakeside trail is an attractive option for local residents and visitors to enjoy expanded soft-surface trail opportunities in the area. Currently, walking along the road is dangerous. Use this trail to also connect to nearby open space and recreation areas.
West Shore Area Connections to	• Boat-in camp spots with docks on the west side of the lake are desired. Some adjacent landowners are interested in selling land to the County for

Locations	Public Meeting and Online Comment Summary
County Open Spaces	recreation purposes, and some concerns exist about facility development impacting neighbors.
Trail Connections	• More trails, including mountain bike trails and multiuse soft-surface trails should circumnavigate Carter Lake and connect to Pinewood and Flatiron. Wider shoulders should be incorporated along roads for bikes and pedestrians.
Overall	• Control height of fires in campgrounds so embers do not fly out of safe zone and threaten surrounding development.

Table 2.3 Pinewood Reservoir Scoping Meeting Comments

Locations	Public Meeting and Online Comment Summary
Launch Area Campsites and Parking Area	• A safe place to swim at the reservoir is needed, but the wakeless nature of the reservoir is appreciated; users love the quiet kayaking/canoeing/ stand-up paddleboard opportunities here.
Pinewood Campground (Windy Pines)	• Cabins could be located closer to other camping. Install a dump station and bear-proof trash bins closer to camping.
Fisherman's Cove Day-Use Area	• Add a self-pay kiosk or a fee station closer to Pinewood Reservoir. Love the improved turnaround access from Pole Hill Road; perhaps add an exit at Ramsay-Shockey trailer pull-through parking lot.
Blue Mountain Area, New Cabins	• Consider keeping Blue Mountain as day use or keeping cabins out of the day-use area (Blue Mountain Trailhead). Could be located near Pinewood Campground or at hike-in locations on the west side of the reservoir.
Overall	• The recent improvements to the reservoir are being enjoyed by users, especially the new binoculars and interpretive signs on the Besant Point Trail. More multiuse trails are desired in the area; a bike lane should be added to access the reservoir. Trail connections need to be expanded to adjacent recreation attractions. Speed limits need to be enforced along roadways.

Table 2.4 Flatiron Reservoir Scoping Meeting Comments

Locations	Public Meeting and Online Comment Summary
Overall	• More multiuse soft-surface connecting trails should be added to this reservoir. • Make Flatiron better for fishing by allowing float tubes. Consider adding a disc golf course, swimming, additional restrooms, and more full-hookup RV campgrounds.

2.7 Management Constraints

The policies affecting management were discussed in Section 1.5, Management Framework. The ability of agencies to manage environmental and recreational resources depends on maintaining sufficient personnel and on the ability of the agencies to obtain adequate funding to operate and maintain facilities and programs. The following discussion addresses the legislative and environmental constraints associated with the management of the four reservoirs.

2.7.1 Legislative Constraints

Project planning and/or development on federal land must comply with a variety of rules, laws, and EOs. These include, but are not limited to, the NHPA, Section 7 of the Endangered Species Act, Migratory Bird Treaty Act (MBTA), Fish and Wildlife Coordination Act, Clean Water Act, Clean Air Act, Americans with Disabilities Act (ADA), and NEPA. These legislative mandates require federal land management agencies to consider the effects of its management decisions on endangered or threatened species, water quality, Indian Trust Assets (ITAs), recreation, fish and wildlife, and cultural resources.

Recreational use of the four reservoirs is secondary to the foremost purpose of water storage: fulfillment of the C-BT Project's purpose of delivering and storing water from the west slope for agricultural and municipal and industrial purposes. Operating the four reservoirs for irrigation, power generation, and other downstream purposes limits Reclamation's ability to manage exclusively for recreation and for natural resources.

Reclamation has a limited opportunity to change the historic operation of the C-BT Project because of its obligations to water users, such as Northern Water. This RMP/EA does not address changes to how the four reservoirs are operated with respect to water deliveries or maintenance of water levels in the four reservoirs. Modifications to existing operating requirements and contractual obligations are beyond the scope of the RMP/EA.

2.7.2 Environmental Constraints

Limiting factors, such as steep slopes, and the lack of an adequate land base at some locations, constrains the development of new or expanded recreation facilities. Constraints to recreation development include the following:

- Presence of a wetland or riparian vegetation.
- Sensitive habitat for certain wildlife species.
- Poor soils for constructing foundations and installing septic systems.
- Reservoir inundation zones (e.g., 100-year flood plain).
- Slopes greater than 10 percent.
- Shoreline erosion areas, especially cliffs that are undercut by wave action.
- Hazardous geologic conditions.

These and other constraints were considered in the development of the RMP/EA.

2.7.3 Carrying Capacity Constraints

The Vessel Capacity Control Programs for Horsetooth Reservoir and Carter Lake identify a boating carrying capacity system to provide a safe boating environment and enhance the recreation experience (Larimer County, 1993). The number of boating vessels (sailboats, water-skiing boats, fishing boats, hand-propelled boats, pleasure crafts, and personal water craft) allowed on the reservoir varies throughout the year based on water levels, decreasing as the water level drops. The carrying capacity is determined by applying acres per boating vessel standards, which are based on National Red Cross boating standards, to the use patterns generally observed on the reservoir during each season. Boating carrying capacity is determined by calculating the number of empty boat trailers plus 20 to 40 percent, on average, of the boats that are in moorings or slips. In the end, the number of available parking spaces and marina slips controls the physical carrying capacity of each reservoir.

Chapter 3 — Alternatives

3.1 Introduction

This chapter discusses the process used to formulate alternatives and describes the alternatives in detail.

3.2 Management Goals and Objectives

Area-wide goals and policies for the RMP were developed in direct response to the issues and opportunities identified during scoping. Each goal is the desired future condition that Reclamation wishes to achieve as a result of the implementation of this revised RMP. Each goal is accompanied by a set of objectives that Reclamation and Larimer County would pursue to attain the goals (desired future condition).

3.2.1 Partnerships

Goal: Partner and Coordinate with Other Programs and Agencies to Manage Reservoir Resources

Objectives

- Maintain strong partnerships between Larimer County, Northern Water, CPW, and other partnering agencies.
- Ensure that recreational uses and facilities are compatible with reservoir operations.
- Strengthen partnerships to document and communicate the management of water levels for recreation.

3.2.2 Recreation and Visitor Services Management

Goal: Provide Safe and Appropriate Recreation Opportunities

Objectives

- Ensure that safe public access to the four reservoirs continues to be available.
- Explore opportunities for additional low-intensity activities.
- Support the Larimer County ranger program and work closely with local emergency services providers.
- Improve and maintain facilities to ensure a high quality and safe recreation experience.

3.2.3 Public information

Goal: Promote Active Outreach Efforts that Celebrate our Resources

Objectives

- Promote active outreach and communication efforts with stakeholders, community leaders, and the public to successfully implement plan recommendations.
- Promote active outreach efforts that celebrate our reservoir resources.
- Provide educational opportunities that foster stewardship of the resources.
- Actively disseminate information about Reclamation and Larimer County programs, conservation, recreation, and the theme of water management.
- Facilitate citizen-led initiatives, volunteers, and other community-based programs to implement the RMP as appropriate.

3.2.4 Operations

Goal: Ensure an Efficient and Effective Operational Structure

Objectives

- Provide appropriate resources to support department management responsibilities, including funding, staffing, training, and equipment.
- Provide staffing levels that meet visitor needs.
- Provide ongoing maintenance and renovation funding to protect the public investment in recreation sites.

3.2.5 Economic Stewardship

Goal: Manage our Resources in an Economically Sustainable Manner

Objectives

- Set realistic fee policies to ensure the operations are mostly self-supporting.
- Leverage resources through partnerships.
- Develop and implement a facility replacement plan and associated funding strategy.

3.2.6 Natural Resource Stewardship

Goal: Conserve and Enhance Natural and Cultural Resources and Water Quality

Objectives

- Control shoreline erosion.
- Continue the long-term water quality program for the reservoirs.
- Improve and avoid fragmenting key wildlife habitats.

- Support Larimer County's efforts to acquire strategic properties adjacent to existing reservoirs to preserve important resource values, for buffering, expanding recreation sites, and create appropriate trail connections as opportunities arise with willing sellers.
- Monitor the natural environment, including plant, and animal diversity.
- Improve ecological connectivity.
- Protect historic properties within reservoir boundaries.
- Continue to monitor and control ANS at the reservoirs.

3.2.7 Innovation

Goal: Promote Innovation and Continuous Improvement

Objectives

- Adapt to changing recreation trends as appropriate.
- Maintain a diversity of recreation opportunities consistent with sound resource management.
- Provide a high quality system of recreation sites and experiences.

3.3 Alternative Formulation

NEPA requires the consideration and evaluation of a range of reasonable alternatives. As discussed in Chapter 1.0, the proposed federal action is to prepare and implement an RMP for the four reservoirs. NEPA provides an established process through which Reclamation, in conjunction with other interested agencies and the public, can formulate alternatives in response to identified issues and concerns. The basic goal in formulating alternatives is to identify various combinations of actions and resource management practices that respond to the issues identified during the planning process.

Public input during scoping and an alternatives workshop assisted in formulating alternatives. Using the planning objectives outlined in the Purpose and Need, Reclamation and Larimer County developed one action alternative, the Proposed Action. The range of reasonable alternatives for this project is limited due to the maturity of the existing reservoirs (i.e. the majority of developable lands have already been developed) and a limited number of resource issues and conflicts that require major changes to the current management direction.

In addition to an action alternative, NEPA requires the consideration of a No Action Alternative. In this case, the No Action Alternative describes management of the four reservoirs in the absence of an updated RMP.

The Proposed Action Alternative is based on conformance to the following criteria:

- Respond to the public need as expressed during the planning and NEPA process (i.e., during open houses, public meetings, and in correspondence) and meet the goals and objectives formulated in response to identified issues and concerns.
- Comply with applicable federal, state, and county laws, regulations, and policy, while not interfering with authorized project purposes.

- Provide the public with a variety of recreational opportunities while minimizing user conflicts.
- Protect and enhance environmental resources.
- Provide for the rehabilitation or replacement of existing facilities to correct identified deficiencies.
- Provide for the construction of needed new facilities.
- Balance expansion efforts with user needs, environmental protection, and anticipated funding.
- Provide for partnership opportunities and shared responsibilities.
- Plan for sufficient funding for operation and maintenance of constructed facilities.

Several potential actions, or program elements, were eliminated from further consideration because of issues and constraints identified during the public involvement process. Alternatives considered but eliminated from further analysis are described in Section 3.8. The remaining two alternatives, the No Action (Alternative A) and the Proposed Action (Alternative B), are described in the remainder of this chapter.

3.4 Alternatives Considered in Detail

Under Alternative A (No Action), no new facilities would be provided to meet existing and future public needs or demands. Current resource management practices and operations would not change. Management actions would occur on a case- by-case basis to meet federal, state, and local laws and regulations. Maintenance of the existing facilities would occur as needed.

Under Alternative B (Proposed Action), additional facilities would be provided, primarily within the existing developed areas. New areas would be developed to accommodate an increase and changes in public demand. Overall, improvements and upgrades would be made to maintain the current level of service.

3.5 Elements Common to All Alternatives

The following elements and management actions are common to all alternatives.

- Adherence to existing and future federal, state, and county laws and regulations (in particular, Public Law 105-277).
- Continuing operation and maintenance of Reclamation lands and facilities contingent on the appropriation of funds.
- Continuing the warning system established by the Coast Guard Auxiliary.
- Continuing existing permitted uses with evaluation of continued use when permits expire.
- Continuing to follow the Federal Wildland Fire Management Policy and the Secretary of the Interior’s fire policy letter of January 18, 2001, and preparation of Fire Management Plan.
- Provide continued outdoor environmental education opportunities. Elements may include nature trails, interpretive signage, or nature talks.

- Improve lighting with fixtures that are consistent with management goals. Dark sky (downcast) light fixtures will be utilized as part of a program of rotating recreation site renovations, which will place priority on camping areas.
- Expand use of web cameras, social media notifications, and explore electronic signs and emerging technologies to inform visitors of parking lot, boat ramp, and other facility availability.
- Provide bear proof trash cans where necessary.
- Continue investigating how to best protect water quality with all involved partners while streamlining the boat inspection process to ensure a pleasurable recreational experience.
- Continue to proactively manage vegetation in designated natural zones to reduce noxious weeds and to encourage native plant populations.
- Work with CPW to cooperatively manage the reservoir lands for fish and wildlife species.
- Continue to monitor, close, and restore social trails that exceed impact thresholds.
- Reissue concession contracts pursuant to Reclamation policy.
- Continue to cooperate with local law enforcement agencies pursuant to signed agreements, including limiting public access in some areas near the dams and other related infrastructure for security purposes.
- Repair and replace deteriorated signs and facilities, including standardizing all monument signs with Larimer County and Reclamation logo.
- Vegetation in developed zones will be well-stewarded as green infrastructure. Landscaping in developed zones, to the extent practicable, will include native plantings.
- Restrict the use of remote control aircraft (drones, model aircraft, or unmanned aerial vehicles) on all of water and land associated with the four reservoirs unless for a specific government project purposes (i.e. grant applications, aerial surveys, etc.) related to the management of the reservoir. Larimer County park regulations restrict operation of “any remote controlled water, surface or air vehicle on Larimer County Natural Resources areas; or to operate any self-powered, water, surface, or air vehicle on Larimer County Natural Resources areas.”
- Prohibit the taking off or landing of seaplanes/floatplanes on the four reservoirs.
- Meet appropriate ADA and Architectural Barriers Act (ABA) accessibility standards.

3.6 Alternative A — No Action

3.6.1 All Reservoir Locations

Under the No Action Alternative, existing use areas would remain essentially unchanged with only minimal improvements and maintenance activities as required to keep the existing facilities in operation. Under the No Action Alternative, the existing RMP would remain in effect for another 10 year period before it would be reviewed again and the standard environmental commitments described in Chapter 5 would remain in effect. The type of recreation, the quality and type of facilities, and current resource management practices would remain the same as they are presently. Existing facilities and recreation opportunities are shown in Table 4.10, Inventory of Existing Facilities.

Ongoing, routine maintenance would continue to occur on an as needed basis and would include operations such as maintaining landscapes at campgrounds, paving or repaving trailheads and parking lots, picnic areas, and other use areas; trail reconstruction and regrading; and the maintenance of restrooms, boat docks, ramps, day-use areas, and other recreation facilities. Limited improvements and upgrades in accordance with evolving and current facility standards would be implemented as funding is available.

Visitation would continue to increase commensurate with the regional population growth and increasing demand for recreation opportunities. Ultimately, however, total visitation would be limited by the availability of parking, facility capacity, and other space constraints. Funding levels, staffing, and management direction would remain consistent with current practices. Under the No Action Alternative, the numbers in Table 4.10, Inventory of Existing Facilities, would not materially change.

3.7 Alternative B — Proposed Action

This section describes the full range of actions that would be implemented. It begins with a description of actions that would occur at all four reservoirs, includes an overview of the amount of new development, and then proceeds to a specific discussion of actions at each reservoir.

3.7.1 All Reservoir Locations

The Proposed Action responds to the planning objectives outlined in the Purpose and Need by addressing existing deficiencies, improving the quality of existing facilities and constructing new facilities to respond to increasing demand. Proposed new facilities are intended to enhance and expand visitor experience and generate the revenues needed to operate in a sustainable manner. Maintenance and enhancement initiatives ensure the provision of a high quality recreation experience and higher quality facilities. A key element of the Proposed Action is a continuing focus on protecting the setting through sound stewardship and development practices that are sensitive to recreation settings and natural resources. Standard environmental commitments are described in Chapter 5 and will be adhered to in all surface disturbing activities.

The Proposed Action is intended to assure that recreation opportunities and facilities would be enhanced, developed, operated and managed at a level consistent with current standards and equal to or better than those provided at other reservoirs in the region.

The following desired future conditions would apply to all four reservoirs.

Desired Facilities and Facility Conditions

- Evaluate the condition of all facilities at all recreation sites. Develop and implement a capital improvement/replacement plan (CIP) to maintain/replace facilities within existing footprints in a properly functioning condition on a rotating basis.
- Per the outcome of the CIP above, renovate existing day use areas (restrooms, picnic tables) and restore social trails.
- As part of the CIP, most parking areas and new roads would be constructed to the appropriate standard to ensure safe access to recreation facilities.

- Pedestrian paths would be constructed in select developed areas to improve visitor experience and safety.
- Nature play areas would be introduced as part of the campground experience where practical at new and existing campgrounds. Elements could include rock, log, and wood structures or other facilities intended to encourage active play without standard playground equipment. An example of this is located at Pinewood Campground.

Desired Interpretation

- Tell the story of water in Colorado, geologic structure of the reservoirs, wildlife habitats, and local history.
- Communicate regulations and expectations for users of public lands.
- Provide information about regional conservation lands and recreational opportunities.
- Provide opportunities for wildlife viewing.
- Provide a setting for interpretive and other presentations (wildlife, recreation, water, geology, history, etc.) where practical and appropriate.

Desired Resource Conditions

- Water Quality: Maintain water quality and quantity suitable for swimming and healthy fish populations as feasible.
- Wildlife: Protect habitat to ensure the presence of wildlife.
- Vegetation: Protect rare plants and manage for native vegetation communities.
- Level of Development: The majority of the four reservoirs will remain natural with a few highly developed areas.
- Level of Resource Management: Natural resource management will ensure a healthy ecosystem for both terrestrial and aquatic wildlife. Management actions will include weed control, forest restoration, limiting fire risk, and minimizing fragmentation of vegetation communities.
- Cultural resources: Protect significant cultural resources to ensure their preservation.

Desired Managerial Conditions

- Provide a high level of safety through appropriate staffing and training levels to include ongoing and meaningful visitor education.
- Maintain facilities at a high quality of condition and cleanliness within financial constraints.

3.7.2 Management Zones

Table 3.1 describes the types of visitor experiences, recreation opportunities, types of facilities, and management strategies applicable to each management zone. Figures showing the application of these management zones to lands at each reservoir are presented throughout this chapter. Five zoning designations for land area were defined, including:

- Highly Developed Recreation
- Moderately Developed Recreation
- Low Developed Recreation

- Natural
- Restricted

In addition to land-based zoning, areas at Horsetooth Reservoir and Carter Lake are designated for wakeless boating (see Figures 3.1 and 3.4).

Table 3.1 Management Zone Classifications and Characteristics

Zone	Visitor Experience and Benefits	Recreation Opportunities	Potential Facilities	Management
Highly Developed Recreation	▪ High social interaction. ▪ Low opportunity for solitude.	▪ High-density recreation. ▪ Emphasis on providing opportunities that rely on motor vehicle access via roads, such as picnicking, RV and tent camping, and shoreline facilities needed to support both motorized and non-motorized boating and swimming.	▪ Typically includes parking areas, paved or high-use roads, boat ramps, marinas, utilities, group picnic areas, visitor services, restrooms, concessions, interpretive facilities and developed camping areas/cabins.	▪ Intense management needs. ▪ Manage to provide sustainable recreation and aesthetic qualities. ▪ Prevent weed spread, erosion, or other degradation. ▪ Revegetate with natives where possible or with non-invasive landscaping. ▪ Public use is the dominant management consideration and resource conflicts will generally be resolved in favor of public use needs.
Moderately Developed Recreation	▪ Moderate social interaction/low opportunity for solitude. ▪ Moderate degree of interaction with the natural environment.	▪ Medium-density, day use recreation. ▪ Emphasis on trail-based activities (hiking, mountain biking, equestrian use etc.) and access for fishing and other trail-based recreation. ▪ Some picnicking, watchable wildlife, interpretive opportunities are likely to occur in this zone.	▪ Typically trails and interpretive facilities, restroom, and individual picnic areas. ▪ Less typically, this could include dirt roads or light use roads, remote and boat-in camping. ▪ Minimize utilities to the extent possible.	▪ Moderate to High management needs. ▪ Manage to maintain the natural character and provide sustainable recreation. ▪ Actively manage weeds in order to eradicate or suppress, and prevent erosion or other degradation. ▪ Revegetate with native species. ▪ Balanced approach, with the dual goals conserving natural resources while allowing for compatible recreation. ▪ Protection of resources remains a priority; however, conflicts between public use and resource protection will be resolved on a case by case basis.

Zone	Visitor Experience and Benefits	Recreation Opportunities	Potential Facilities	Management
Low Developed Recreation	▪ Moderate social interaction/low opportunity for solitude. ▪ Moderate-High degree of interaction with the natural environment.	▪ Medium- to low-density recreation. ▪ Emphasis on providing low impact, non-motorized and dispersed recreation. ▪ All recreation opportunities in the Moderately Developed Recreation Zone are likely to occur here with more of an emphasis on providing non-motorized dispersed recreation.	▪ Limited trails and some interpretive facilities. ▪ Minimize utilities to the extent possible.	▪ Moderate to low management needs. ▪ Manage to maintain the natural character, the native flora, the wildlife habitat, and the ecological functions. ▪ Actively manage weeds for eradication, prevent erosion or other degradation. ▪ Revegetate with native species ▪ In a low developed area, if a conflict arises between a natural or cultural resource and a competing use, it will be resolved in favor of the protected resource.
Natural	▪ Low-Moderate social interaction with moderate opportunity for solitude. ▪ High degree of interaction with the natural environment.	▪ Limited, including wildlife observation and nature study.	▪ Few, if any facilities.	▪ Moderate to low management needs. ▪ Manage to maintain the natural character, the native flora, the wildlife habitat, and the ecological functions. ▪ Actively manage weeds for eradication, prevent erosion or other degradation. ▪ Revegetate with native species. ▪ Hunting for the management of healthy wildlife populations and habitat. ▪ In a resource protection area, if a conflict arises between a natural or cultural resource and a competing use, it will be resolved in favor of the protected resource.

Zone	Visitor Experience and Benefits	Recreation Opportunities	Potential Facilities	Management
Restricted	▪ Typically applied to areas with dams or other sensitive infrastructure. ▪ Sensitive resource protection areas.	▪ None, or heavily restricted.	▪ None.	▪ Least intense management needs, though infrastructure requires ongoing maintenance, including weed control and vegetation management. ▪ Preservation of very sensitive resources or restriction of visitor use for legal or safety reasons. ▪ Operational and internal uses are primary.
Motorized Multiple Use	▪ High social interaction. Low opportunity for solitude.	▪ High-density recreation for all types of water craft.	▪ Buoys to delineate from wakeless boating area.	▪ Intense management needs. Manage to provide sustainable recreation and aesthetic qualities. ▪ Boats must travel in counter clockwise direction. ▪ All trailered motorized water craft are subject to inspection for ANS. ▪ Managed for a sustainable fishery and water quality.
Wakeless Boating	▪ Typically applied to areas near boat ramps, congested areas, along sensitive shorelines, or in coves.	▪ Paddle sports, hand-powered craft, motorized craft not producing a wake. In designated areas, scuba diving, and swimming.	▪ Buoys to delineate area from Motorized Multiple Use area. Typically paired with developed recreation facilities.	▪ Moderate to High management needs. ▪ Manage to maintain the natural character and provide sustainable recreation. ▪ Managed for a sustainable fishery and water quality.

3.7.3 Overview of New Facilities and Improvements

Table 3.2 indicates the total acres of new development on undeveloped lands at each of the four reservoirs. Much of the total acreage proposed for development or enhancement under Alternative B is located within existing developed or disturbed areas such as Horsetooth Reservoir (approximately 14 acres at Satanka Cove and 31 acres north of the Horsetooth Dam).

Table 3.2 Total Acres of New Development

Reservoir	Acres
Horsetooth Reservoir	47
Carter Lake	18
Pinewood Reservoir	0.5
Flatiron Reservoir	0.1
Total Acres	**65.6**

**New development within the footprint of existing developed recreation sites is not included in these totals.*

Table 3.3 shows the number of new campsites that would be added at each reservoir.

Table 3.3 Comparison of Planned Campsites and Parking Spaces

	Horsetooth Reservoir	Carter Reservoir	Pinewood Reservoir	Flatiron Reservoir	Net Change
Proposed new RV campsites	0	+6	0	0	+6
*Proposed new tent campsites **	0	+6*	0	0	+13
Proposed new cabins	0	+6	0	0	+6
Proposed new car parking spaces	+40	+165	0	0	+205
Proposed new trailer parking spaces	+90	+57	0	0	+147

**Addition of 20 sites at Big Landia, removal of 7 sites from Carter Knolls and 7 sites from Big Thompson.*

Concept plans for new and expanded facilities were prepared in key areas at each reservoir in order to illustrate preliminary site layout and support an estimate of the amount of potential disturbance. These plans are preliminary and actual project layout and other specifics may vary. The concept plans are presented in the area by area discussions per reservoir.

3.7.4 Resource Management and Environmental Protection

The following actions have been identified to maintain and enhance environmental quality at the four reservoirs.

Water Quality

1. Control adverse water quality effects from human activities.
    - Limit camping below the high water mark.
    - Do not allow access to the water by aircraft.
    - Continue to actively work to protect waters from contamination from recreational boating including spill containment at marinas.
2. Provide adequate sanitation and waste management facilities at all recreation sites.
    - Identify the need for additional waste management facilities.
    - Allow camping in designated sites only.

3. Protect or restore shoreline vegetation as a means of controlling erosion.
    - Identify areas with erosion problems.
    - Evaluate the need for and cost of revegetation in areas with erosion problems and recommend a restoration plan.
4. Consider land use control strategies.
    - Coordinate with the Larimer County Community Development and Health and Environment Departments to minimize the contamination from sewer systems and other land uses.
5. Design catchment basins and/or treatment wetlands to detain runoff from campgrounds and parking lots.

Fish and Wildlife

1. Enhance public awareness of fish resources in the reservoirs through educational and informational programs.
2. Improve the recreational fishing experience by refining and enforcing regulations.
3. Coordinate with state and local agencies in managing vegetation and wildlife resources.
    - Work with the CPW and Colorado Natural Heritage Program (CNHP) to enhance wildlife habitat and protect existing biological diversity.
    - Enforce fishing regulations.
    - Identify any important wildlife resources that are currently undocumented (e.g. active raptor nests).
    - Upon identification, develop appropriate management strategies to protect these resources
    - Develop suitable monitoring programs, especially as reservoir use increases.
    - Continue to implement adopted forest management plans developed in partnership with the Colorado State Forest Service (CSFS) to ensure healthy forest conditions, including mitigation of hazardous trees, suppression of disease and forest pests, minimization of catastrophic wildfire and restoration of natural forest conditions.
    - Retain snags that do not pose a potential hazard for nesting birds and raptor use.
    - Limit user conflict and vandalism through effective enforcement and education efforts.
    - Work with the Fort Collins Natural Resources Department regarding resource protection (e.g., rare butterfly habitat, mule deer winter habitat, raptor nests). Cooperate to provide adequate trail maintenance along ownership boundaries on the eastern ridgeline of Horsetooth Reservoir, including Pineridge Natural Area.
    - Coordinate with the City of Fort Collins to identify important habitat along the eastern ridge that may support rare butterfly species and develop a plan to prevent habitat loss/fragmentation in these areas. Work with CPW to investigate allowing limited opportunities for waterfowl hunting in remote areas of Horsetooth Reservoir during low use seasons.

4. Establish measures to avoid conflict or adverse impacts to important vegetation and wildlife habitat resulting from human activities.
    - Avoid wetland and rare plant communities for hiking, mountain biking and horseback riding. Minimize these activities in riparian habitats.
5. Protect and enhance wetlands near the four reservoirs in accordance with existing federal regulations.
    - Maintain tree canopy, understory, and existing snags.
6. Protect riparian zones important to resident and migratory wildlife species.
    - Restrict development within the riparian zones.
    - Maintain tree canopy and understory.
    - Retain existing snags for cavity-nesting birds.
    - Plan trail development to minimize impacts to nesting songbirds.
    - Eradicate exotic plant species while maintaining native plant diversity and water levels.
7. Protect and maintain habitat for rare and endangered species.
    - Restrict hiking, mountain biking and horseback riding to designated trails and avoid new trail development, including social trails in areas near Bell's twinpod populations or rare butterfly habitat.
    - Coordinate with CPW regarding protection of any site that is identified as significant to particular wildlife species.
    - Retain snags or other roost sites around the reservoirs for use by wintering bald eagles.
8. Improve public awareness of vegetation and wildlife resources through educational and informational programs.
    - Coordinate with state agencies to increase public awareness of and enhance habitat for Bell's twinpod (e.g., "Adopt a Plant Program").
    - Provide educational information about vegetation types present in the general vicinity of the four reservoirs and the importance of existing rare plant communities (i.e.: mountain mahogany shrublands), rare plants (i.e.: Bells twinpod) and significant habitats (i.e.: rare butterfly habitat).
    - Evaluate with CPW opportunities for developing "Watchable Wildlife Programs" for the public. These programs are often led by CPW employees or community volunteers.
    - Coordinate with partners in developing interpretive signs or kiosks in appropriate areas. Cooperate on community programs to provide public information or education programs, designed to minimize conflicts and resource damage, and to encourage community participation.
    - Provide educational information relative to the importance and value of wetlands and riparian habitat.
9. Reclaim disturbed areas with native plant species to enhance existing wildlife habitat.
    - Establish native plants in areas disturbed by new or prior construction.
    - Control the invasion and spread of undesirable exotic plants that threaten the native habitat value or biological diversity.

10. Work with CPW in developing and implementing fishery management and habitat improvement techniques.

Cultural Resources

1. Improve public awareness of significant cultural resources through educational and informational programs as appropriate. Inform public of the civil and criminal penalties for excavation, removal, damage, or defacement of cultural resources on federal lands under ARPA.
2. Provide educational information on the history of the area, including early settlement activities as well as Native American use and occupation.

Paleontological Resources

1. Improve public awareness of paleontological resources through educational and informational programs as appropriate
2. Inform public of the civil and criminal penalties for fossil theft and vandalism under the PRPA.

Recreation and Visitor Services Management

1. Larimer County should continue to operate and manage the recreation and other visitor services (reservations, facility management, and programming) at the four reservoirs. Staffing levels should be optimized to meet visitation levels and facility maintenance needs.
    - Visitor information should continue to be provided at all entry stations, self-service stations and at the Natural Resources Administration Building, Horsetooth Area Information Center, etc. Information about visitor regulations as well as environmental education, wildlife and cultural resource interpretive displays, and education programs should also be provided.

Road and Recreation Site Maintenance

1. Larimer County will continue to be responsible for recreation facilities, lands and road maintenance. Larimer County Road and Bridge Department will continue to be responsible for maintenance of county roads around the four reservoirs.
    - Primary circulation roads should be paved (e.g., recycled asphalt or aggregate base), and secondary roads graded as necessary to keep the surfaces in acceptable condition.
    - Provide adequate staffing and funding for on-going maintenance.

Public Safety

1. The Larimer County rangers are responsible for law enforcement, including enforcement of public use regulations at the four reservoirs. They also play an important role in responding to medical emergencies and other public safety related incidents.
2. Local ambulance services, fire districts, and the Larimer County Sheriff's Department will continue to be key partners for Reclamation and Larimer County.

3. Provide adequate numbers of rangers that are properly trained and equipped to sufficiently enforce the rules and regulations, and to respond to emergencies such as medical emergencies, wildland fires, and water related emergency calls, etc.
    - Continue to enforce vessel regulations, wakeless zones, travel directions, and mark water hazards as feasible to reduce the likelihood of boating accidents on reservoirs where boating is allowed.
    - Provide information regarding safe boating practices.

3.7.5 Horsetooth Reservoir

In addition to the principles and actions listed in Section 3.7.1, the following statements apply to Horsetooth Reservoir:

Desired Recreation Activities (see Figure 3.1)

The key recreation activities and experiences provided for at Horsetooth Reservoir include:

- Higher speed motorized boating in open water – primary activity.
- Fishing.
- Highly social and developed full-service camping adjacent to the reservoir, including multiuse campsites, cabins, and dump station.
- Full service marina.
- Primitive boat-in camping in remote shoreline locations.
- Picnicking in scenic locations.
- Swimming at designated and protected natural swim areas.
- Trail use with connections to regional trails and adjacent public lands.
- Group picnics and events.
- Rock climbing.
- Facilities to host weddings, family functions, and events.

Desired Resource Conditions

- Protect paleontological resources.
- Coordinate with CPW and the Fort Collins Natural Areas Department to minimize human disturbance to bald eagles occurring along the eastern portion of Horsetooth Reservoir.
- Control potential pollutants (gasoline, petroleum products) associated with boat activity.
    - Develop education materials for distribution at entrances to educate the public about methods to minimize gasoline or petroleum leaks.
    - Ensure that marina is following best management practices for fueling boats and the use of fuel containers.

Desired Managerial Conditions

- Manage for a high level of visitation and revenue.

- Boating capacity thresholds, which are described in Chapter 2, would remain in place and continue to be implemented under current practices.

New Development

The amount of area that would be needed to accommodate proposed new facility development is shown in Table 3.4. If areas are not listed in this table, no new development will occur beyond the existing developed footprint. Area by area discussion follow, including concept plans for those areas where new or expanded facilities are planned.

Table 3.4 Total Acres of New Development by Site: Horsetooth Reservoir (acreages have been rounded)

Site	Acres
*South Bay- Day Use Area**	2
North of Horsetooth Dam	31
Satanka Bay and Expanded Parking	14
Total Acres	**47**

**Assumes one mile trail with 10 feet width of disturbance.*

Inlet Bay

This area is heavily used and very little usable area remains for facility expansion. Therefore, the Proposed Action focuses on several enhancements intended to reduce user conflicts and upgrades to key facilities. These upgrades include improving the efficiency of parking by paving and striping the major lots and upgrading the existing gatehouse with a standard design that provides ADA and ABA accessibility and an employee restroom.

Other specific improvements are listed below.

Campground

- Add safety signage and wayfinding to reduce conflicts for Inlet Bay Trail users and vehicles.
- Investigate potential to improve functionality and add up to five campsites without using fill material.
- Convert some existing electric sites to full hookup campsites.
- Replace water line.

Marina

- To improve parking efficiency, pave and stripe the major parking lots.
- Improve entrance road.
- Investigate a potential trailer parking reservation system.
- Add flush toilet and new shelter.
- Replace unhealthy trees and enhance screening near existing docks.
- Reconstruct Inlet Bay Marina Store on land and consolidate with remodeled Maintenance Shop.
- Replace flag pole lighting to reduce glare.

- Construct row boat storage building and dock with partners.
- Add new hiking and mountain biking trail connecting South Bay to Inlet Bay. Avoid disturbance of sensitive wildlife habitat.

South Bay

Similar to Inlet Bay, this area is limited for facility expansion. Instead, the Proposed Action focuses on providing better pedestrian and biking connections to the area and a series of facility upgrades and enhancements. Improvements to existing parking areas are one of the key actions along with replacing the upper boat ramp and upgrading the existing gatehouse with a standard design that provides ADA and ABA accessibility and an employee restroom.

Other specific projects are listed below.

Campground

- Investigate opportunities for additional parking at camping areas.
- Investigate potential to improve functionality and add a limited number of campsites without adding fill material below the high water mark.
- Upgrade some existing electric RV sites to full-service hookups.
- Replace existing modular cabins that have exceeded their useful life with high quality camper cabins.

Day Use Area

- Add new hiking and mountain biking trail connecting South Bay to Inlet Bay. Avoid disturbance of sensitive wildlife habitat.
- Replace pit toilets with a vault toilet at ramps.
- Re-surface and stripe parking lot at boat ramp.
- Replace docks.
- Repave/upgrade upper ramps.
- Investigate opportunities for further site and safety improvements at the natural swim area.

Duncan's Ridge/Torture Chamber

- Improve signage and information about the area.
- Work with City of Fort Collins to maintain parking area at Duncan's Ridge.
- Work with climbing community to maintain access and develop a stewardship plan.

Rotary Park

- Address nuisance uses by controlling access or by other means.
- Increase restoration efforts on social trails.

Lower Sunrise

- Add shelters to existing picnic tables.
- Add stairs to help with changing water levels.

- Add signage and enforce no dogs off-leash/in water regulations.

North of Horsetooth Dam (See Figure 3.2)

- Develop a static Archery Range near CR 25G. This area was disturbed in the past by motorized recreational use. Allow day use only with safety as a priority (target distance, terrain shielding, etc.)
- Provide 40 parking spaces.
- Add a large group day use area and shelter.
- Provide a locked gate when archery range is closed (sunset to sunrise).
- Fence off riparian and wetland area from archery range to prevent social trails, fragmentation or disturbance.
- Construct single track trail with 3D targets along trail.
- Design and build archery range in a manner that helps protect public safety.

Satanka Bay and Expanded Parking Area (See Figure 3.3)

- Add guardrail path on south side of dike.
- Develop approximately 90 new trailer parking spaces. Construction would be phased in response to observed demand. This parking area would be used primarily during periods of higher demand, such as weekends and holidays.
- Construct 900 foot road access from Satanka Boat Ramp to parking in the North Dam area.
- Provide 1,200 foot access trail from parking to top of the day-use area with switchbacks up ridge.
- Construct an improved paddle sports launch area. Provide sand, improved access and other means to reduce bank erosion and improve the visitor experience.

Boat-In Access on West Shoreline Coves

- Plant natural vegetation to screen Dixon Cove outhouse.
- Add composting toilets at South and North Eltuck Coves.
- Add two new mulching toilets in the coves (day use).

Blue Sky Trailhead

- Plant vegetation to screen parking lot from county road.

Other Trails

- Investigate opportunities to work with other county departments to improve bicycle access and public safety along CR 38E to Horsetooth Reservoir.

Resource Enhancements

- Remove old fences on east side of reservoir to reduce wildlife barriers and mortality.

Figure 3.1 Horsetooth Reservoir Management Zones

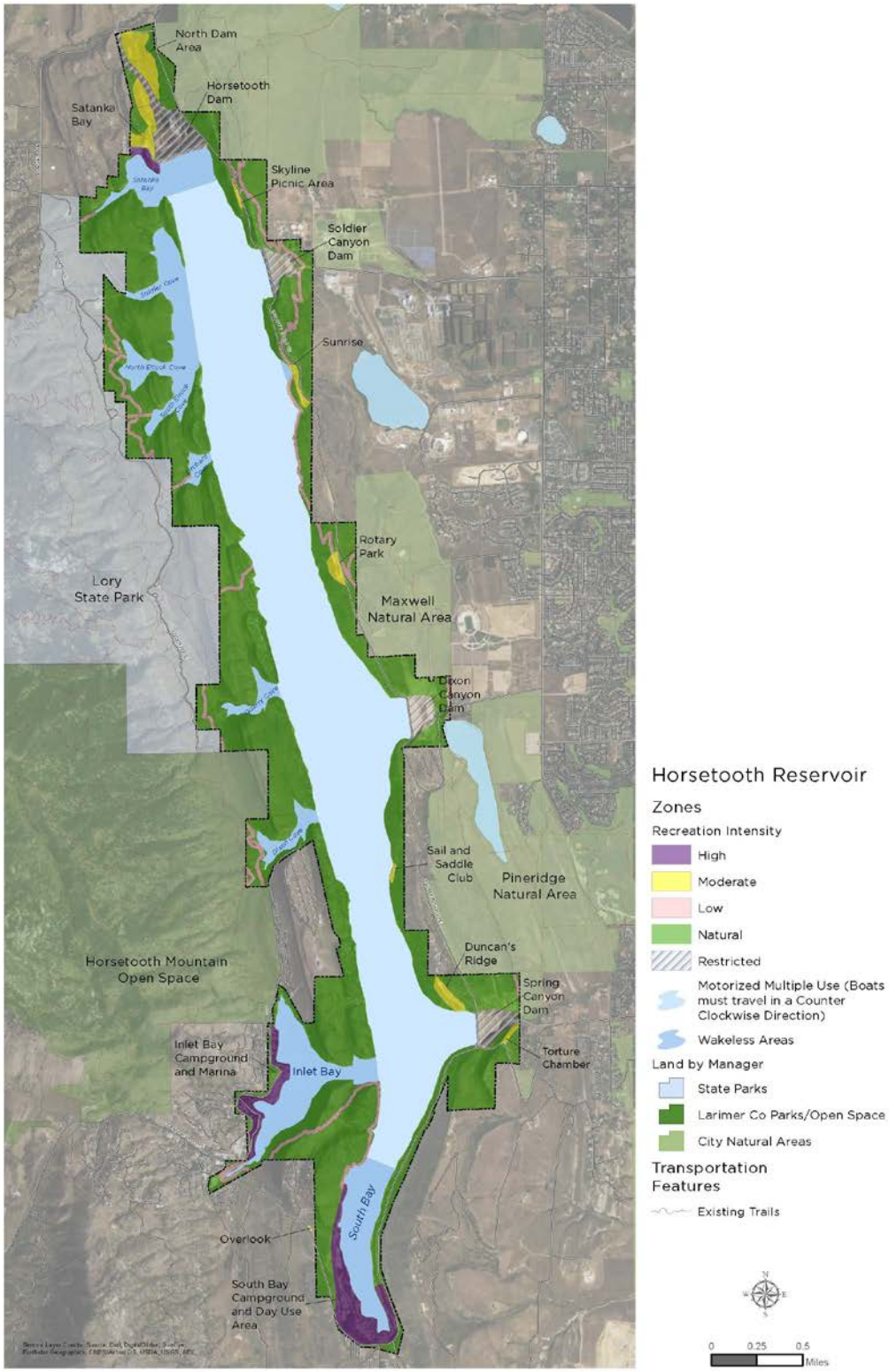
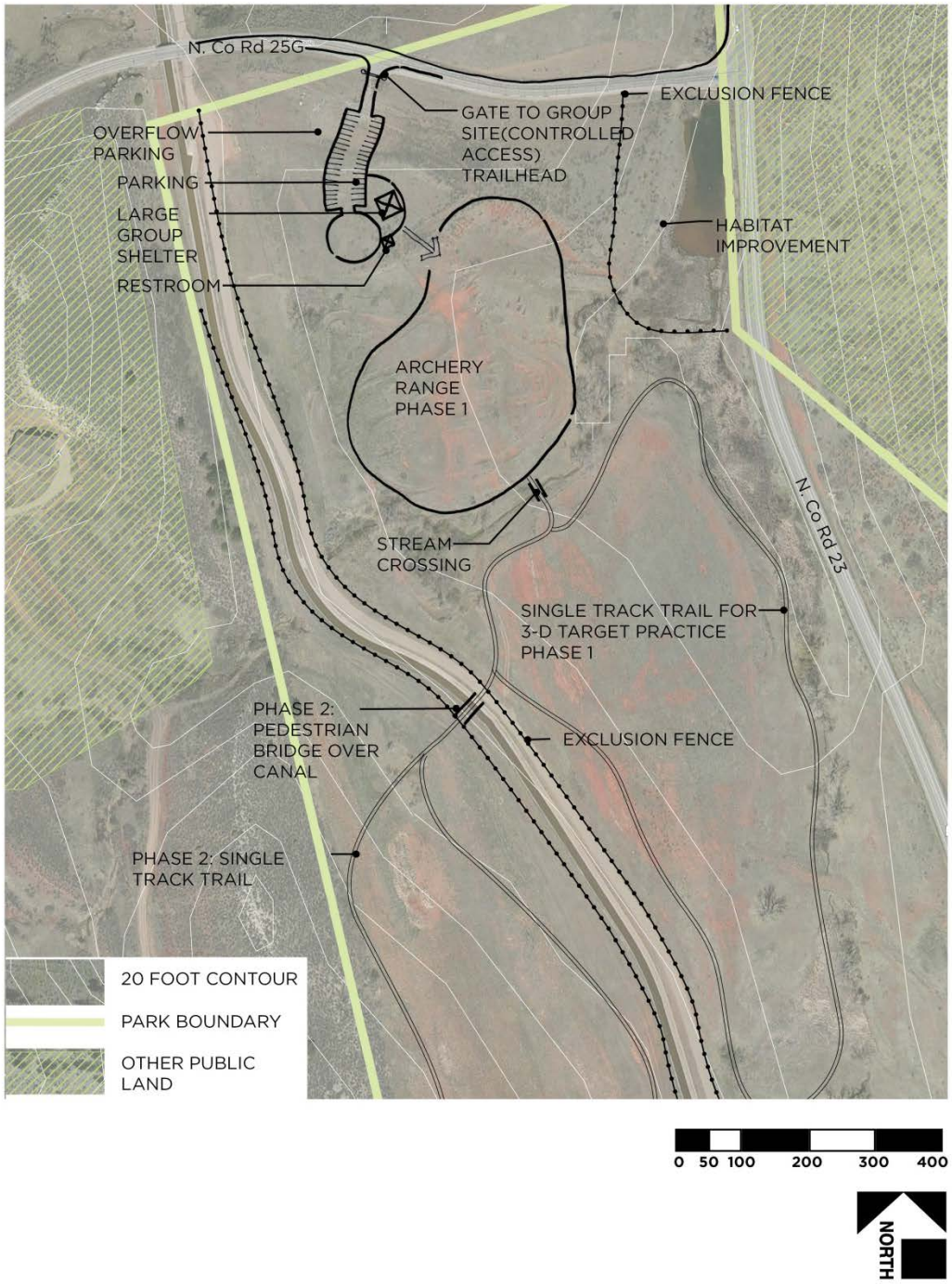


Figure 3.2 North Dam Concept Plan



NORTH DAM

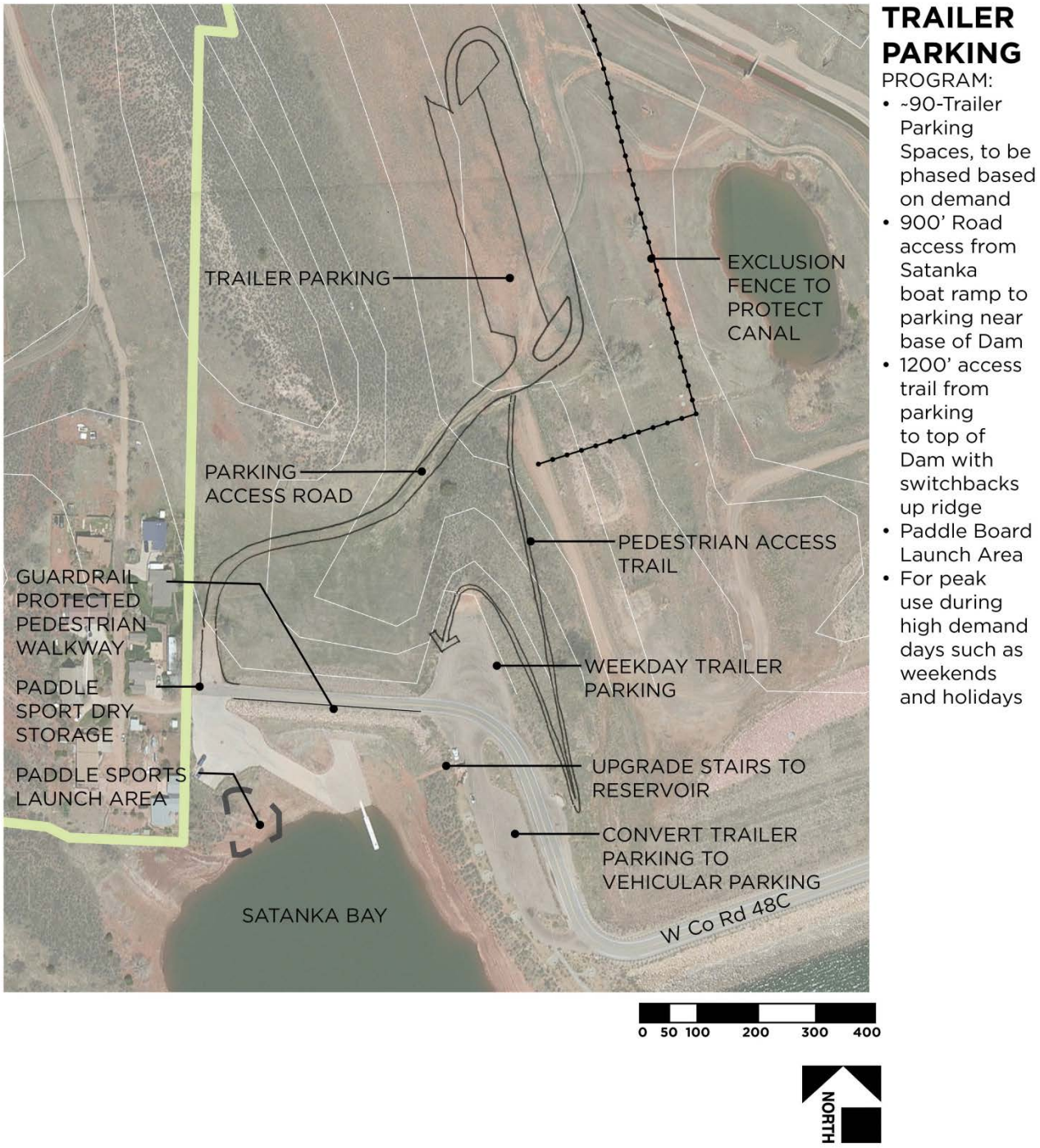
PROGRAM:

- 40-Parking Spaces
- 1-Large Group Use Area & Shelter
- Gate- Locked when archery range closed
- Habitat improvements
- Natural surface trail with 3D targets along trail
- Archery Range would be day use; additional fee for 3D target loop.
- Safety would be a priority in the design (target distance, terrain shielding, etc.)

Phase 2 could include:

- Pedestrian Bridge
- Additional single track trail
- Additional 3D targets

Figure 3.3 Satanka Bay Concept Plan



3.7.6 Carter Lake

In addition to the principles and actions listed in Section 3.7.1, the following statements apply to Carter Lake:

Desired Recreation Activities (See Figure 3.4)

- Motorized boating in open water—primary activity.
- Sail boating and associated events.
- Fishing opportunities.
- Highly social and developed full-service camping adjacent to the reservoir, including multiuse campsites, cabins and walk-in tent sites.
- Full service marina.
- Picnicking in scenic locations.
- Swimming at designated and protected natural swim areas.
- Trail use with connections to regional trails and adjacent public lands.
- Group picnics, camping, and events.
- Rock climbing.

Desired Resource Conditions

- Control potential pollutants (gasoline, petroleum products) associated with boat activity.
  - Develop education materials for distribution at entrances to educate the public about methods to minimize gasoline or petroleum leaks.
  - Ensure that marinas are following best management practices for fueling boats and the use of fuel containers.
- Restrict vehicle use below the high water mark, except on the east shore line when the water level is low.

Desired Managerial Conditions

- Manage for a high level of visitation with sustainable revenue sources.
- Boating capacity thresholds, which are described in Chapter 2, would remain in place and continue to be implemented under current practices.

New Development

Several facility upgrades and new use areas are proposed at Carter Lake. The amount of area that would be needed to accommodate proposed new facility development is shown in Table 3.5. If areas are not listed in this table, no new development would occur beyond the existing developed footprint. Area by area discussions follow, including concept plans for those areas where new or expanded facilities are planned.

Table 3.5 Total Acres of New Development by Site: Carter Lake

Site	Acres
North Pines Campground	1
*North Shoreline**	.4
Eagle Campground	3.8
Big Thompson & Quarry Area	4
Big Landia	15
South Shore Campground	.25
Total Acres	**24.45**

**Assumes one mile trail with 10 feet width of disturbance.*

North Pines Campground (See Figure 3.5)

- Add approximately 10 new parking spaces.
- Add approximately 22 new trailer parking spaces, including 11 pull through and 11 pull in.
- Replace existing camping sites with day use areas.
- Construct dryland boat storage racks.
- Replace or improve the Sail Clubhouse in partnership with the sail club.

North Shoreline

- Connect North Pines and Marina with a trail, potentially with aggregate base course along the shoreline.
- Add wayfinding and interpretive signage and benches.

Eagle Campground

- Construct 3 new cabins.
- Construct a wildlife friendly privacy fence to screen residences.
- Add campsites west of existing sites in the meadow.

Marina Area

- Repave and upgrade boat ramps.
- To improve parking efficiency, pave and stripe the major parking lots.

Big Thompson & Quarry Area (See Figure 3.6)

- Convert the campground to a day use area.
- Provide approximately 90 parking spaces for day use at Big Thompson.
- Designate and delineate up to 3 areas along the shoreline for swimming.
- Develop a trail leading south to the existing natural swim area.
- Construct quarry overflow parking area in a future phase. Parking would be a natural surface and used only seasonally during high water. It would include approximately 45 vehicle parking spaces and 35 boat trailer parking spaces.
- Provide a floating courtesy dock.

- Construct an enhanced pedestrian crossing and steps to the courtesy dock.
- Construct an overlook along CR 31.

Natural Swim Area (See Figure 3.7)

- In concert with implementation of the Big Landia campground, convert the Natural Swim Area to walk-in and bike in only access. Close entry road and eliminate parking.
- Upgrade existing restroom.
- Provide trail access from Big Thompson area and new use area at Big Landia.

Big Landia (See Figure 3.7)

- Construct 1 new restroom.
- Add approximately 20 parking spaces.
- Add 20 tent pads.
- Construct a group campground with large group shelter and fire ring.
- Operate group campground by reservation only, and install a locked gate for use during unreserved periods. Open camping to individual reservations if area is not reserved by groups (2 weeks out).
- Construct trail to existing natural swim area in a manner that protects the dam and install a cross walk to safely channel visitors crossing the county road.
- Add a loop trail extending to south.

Carter Knolls (See Figure 3.8)

- Replace existing tent sites with 6 cabins with picnic tables and 6 RV pull through sites (no hookups available).
- Maintain one existing restroom.
- Provide 12 parking spaces.

South Shore Campground

Several improvements to this area were identified in the 2007 RMP/EA and these projects are already underway.

- Following the opening of Chimney Hollow Open Space to public use, finalize an alignment for and construct a connector trail from Carter Lake.

South Entrance Station

- Upgrade the existing gatehouse with a standard design that provides ADA and ABA accessibility and an employee restroom.
- Investigate feasibility of replacing existing dump station with a connection to a sewer line.

Figure 3.4 Carter Lake Management Zones

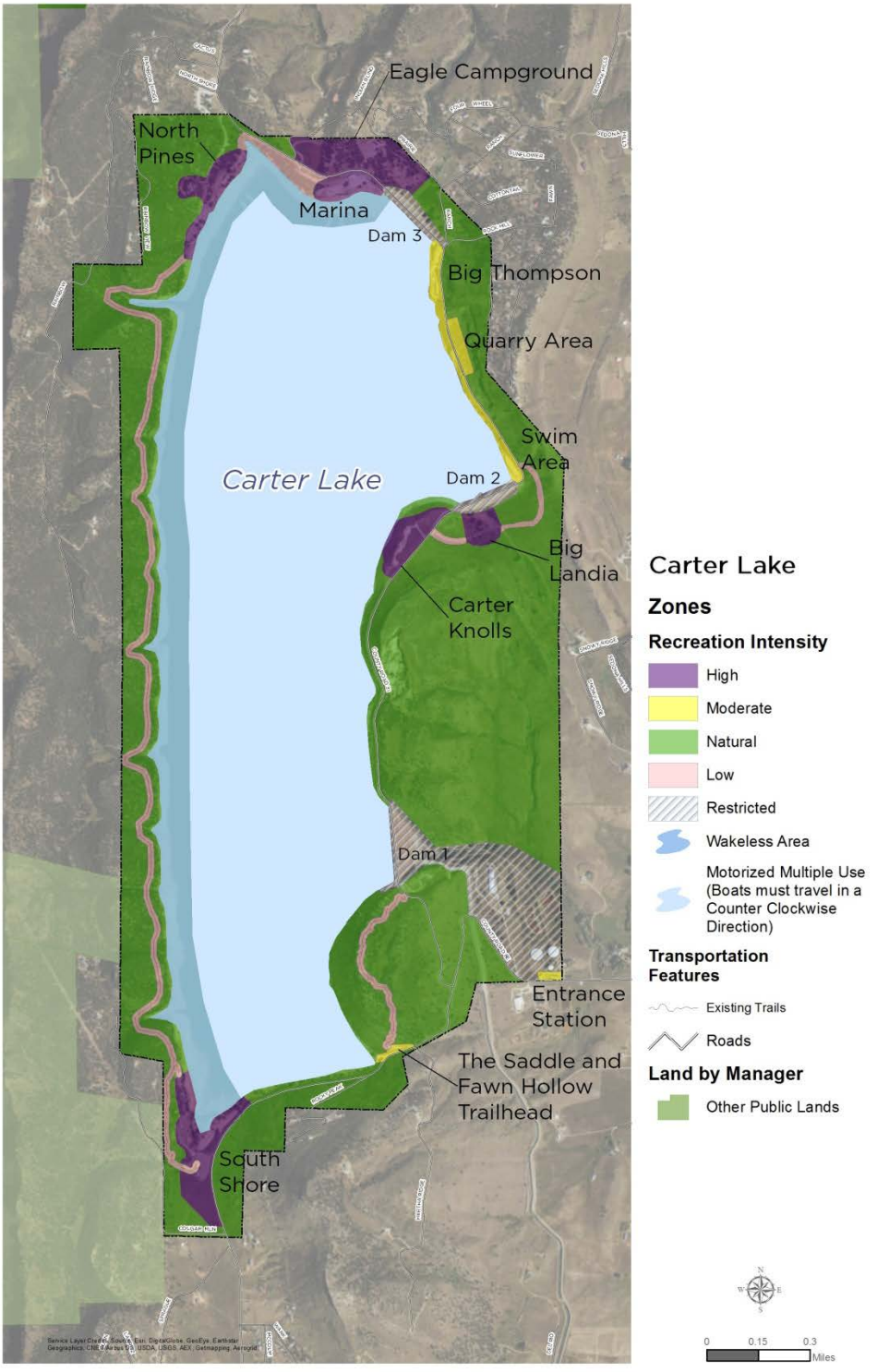


Figure 3.5 North Pines Concept Plan

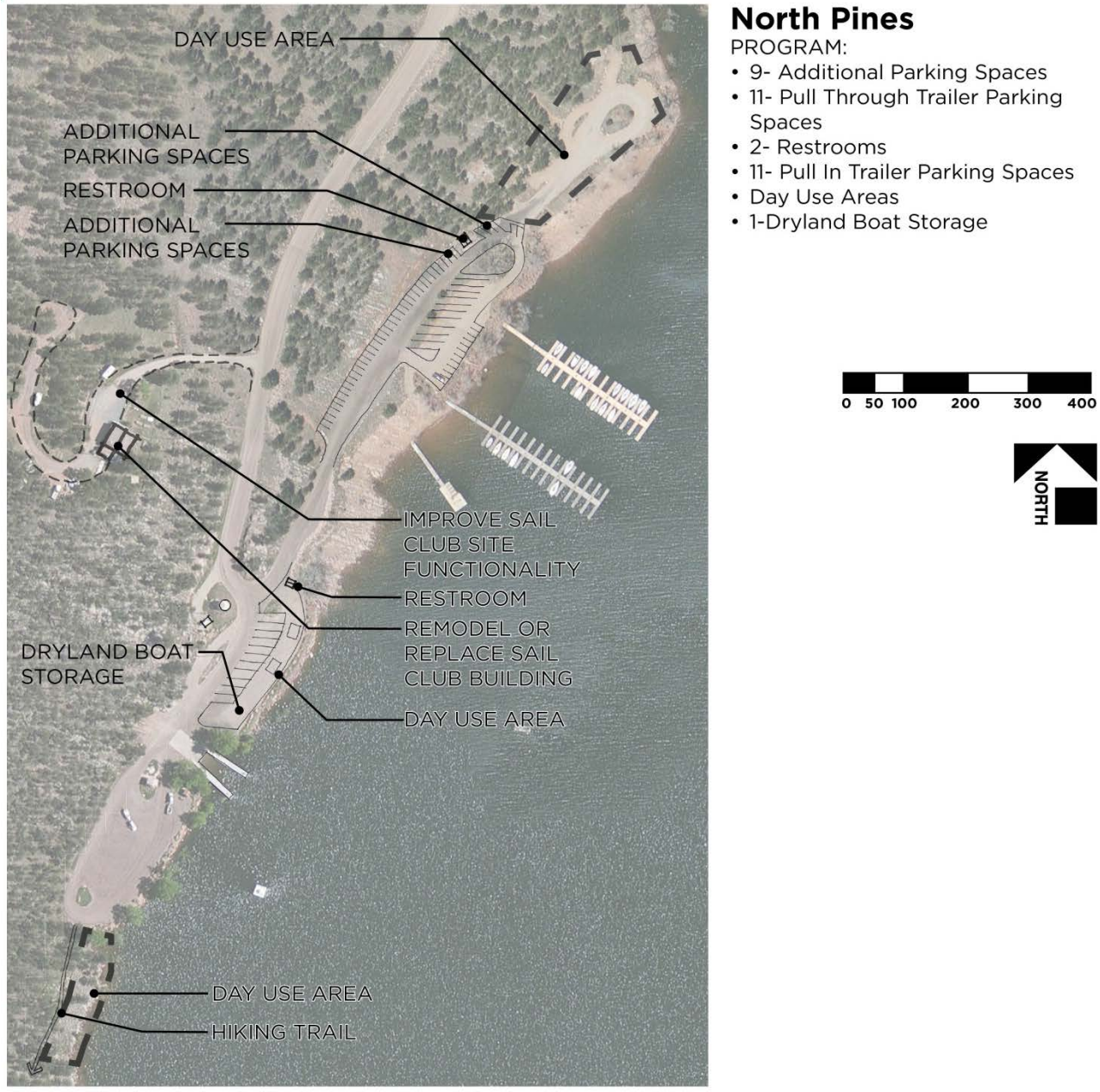


Figure 3.6 Big Thompson and Quarry Area Concept Plans

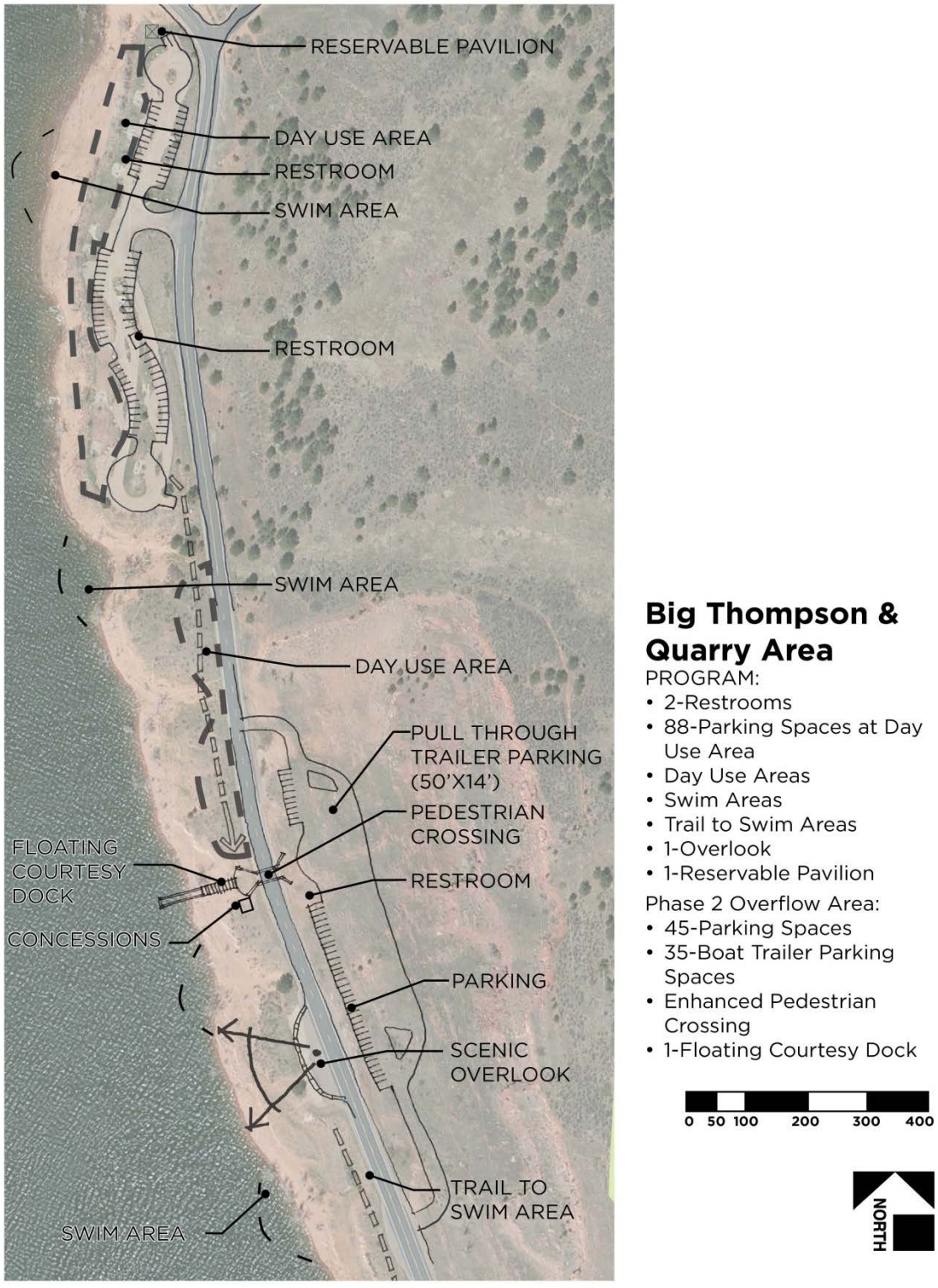


Figure 3.7 Big Landia and Swim Area Concept Plans

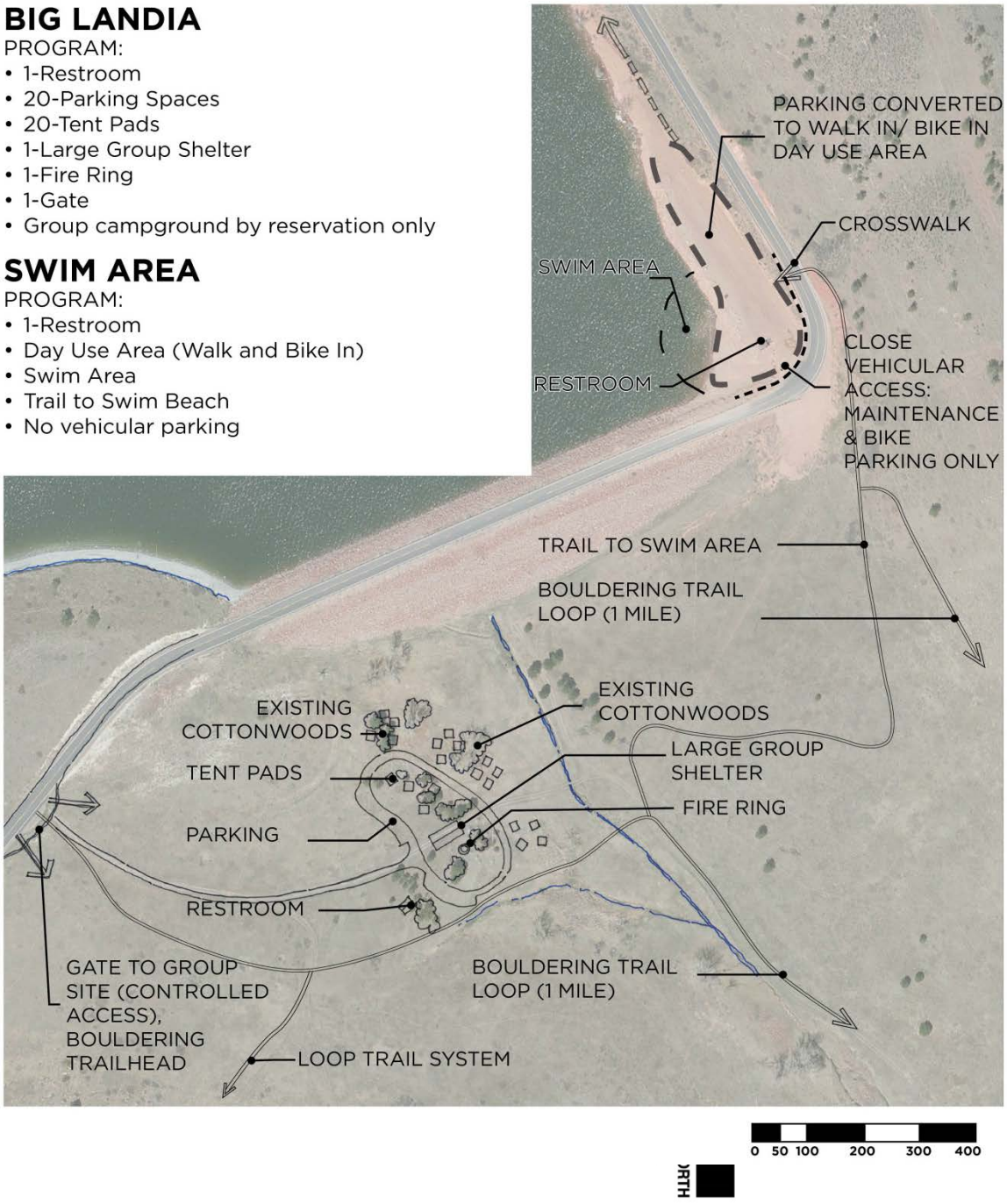
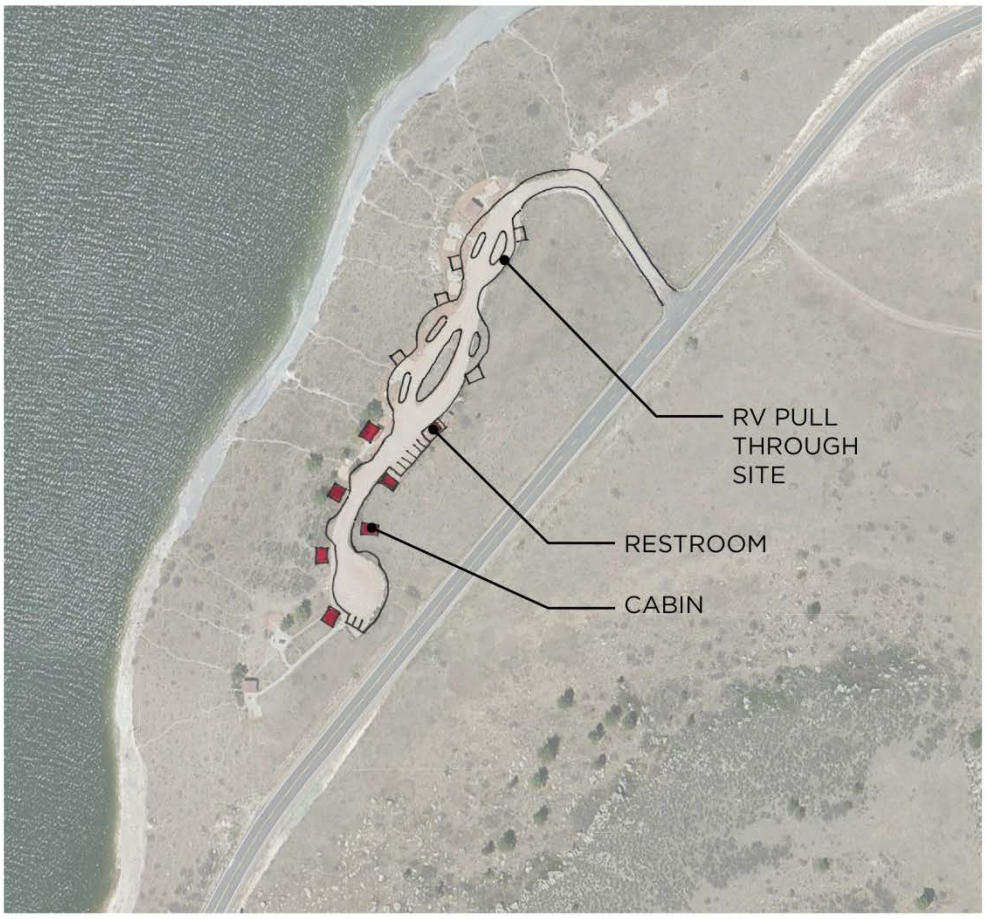


Figure 3.8 Carter Knolls Concept Plan



CARTER KNOLLS

PROGRAM:

- 6-Cabins With Picnic Area
- 12-Parking Spaces
- 1-Restroom
- 6-RV Pull Through Sites

NORTH

0 50 100 200 300 400

3.7.7 Pinewood Reservoir

ANS regulations apply to this wakeless boating reservoir. All boats must be inspected unless they are pre-inspected at another ANS facility.

Desired Visitor Experience (see Figure 3.9)

- Fishing opportunities – primary activity.
- Non-motorized boating and no-wake motorized boating.
- Somewhat social, rustic camping adjacent to the reservoir with multiuse and walk-in campsites.
- Day use and picnicking in a scenic location.
- Trail use with connections to regional trails and adjacent public lands.

Desired Resource Conditions

- Level of Development: Most of the reservoir will remain natural with very little development and no large structures.
- Control potential pollutants (gasoline, petroleum products) associated with boat activity.
  - Develop education materials for distribution at entrances to educate the public about methods to minimize gasoline or petroleum leaks.

Desired Managerial Conditions

- Manage for a moderate level of visitation and revenue.

New Development

Pinewood Reservoir's electrical campsites, a natural playscape/outdoor classroom, new vault restrooms and other recreation facilities were upgraded in 2015 under the 2007 RMP. Proposed new improvements focus on vehicular circulation and safety improvements within the existing developed areas.

Fisherman's Cove Day Use Area (See Figure 3.10)

- Add exit/entry to parking lot on south side of parking lot.
- If necessary for dam security, add future trailhead below dam and improve trail sustainability to Fisherman's Cove Parking.
- Add self-service permit kiosks.

Launch & Parking Area

- Replace ramp with new 60 foot boat ramp.
- Improve safety and add signage near dam area stressing that the area is closed to swimming.
- Consider implementing vessel inspections within existing financial constraints.

Pinewood Campground

- Add self-service kiosks.

Blue Mountain Day Use Area

- Upgrade day use area.
- Add no swimming signage near penstocks / siphon area, change safety rope to indicate danger.

Figure 3.9 Pinewood Reservoir Management Zones

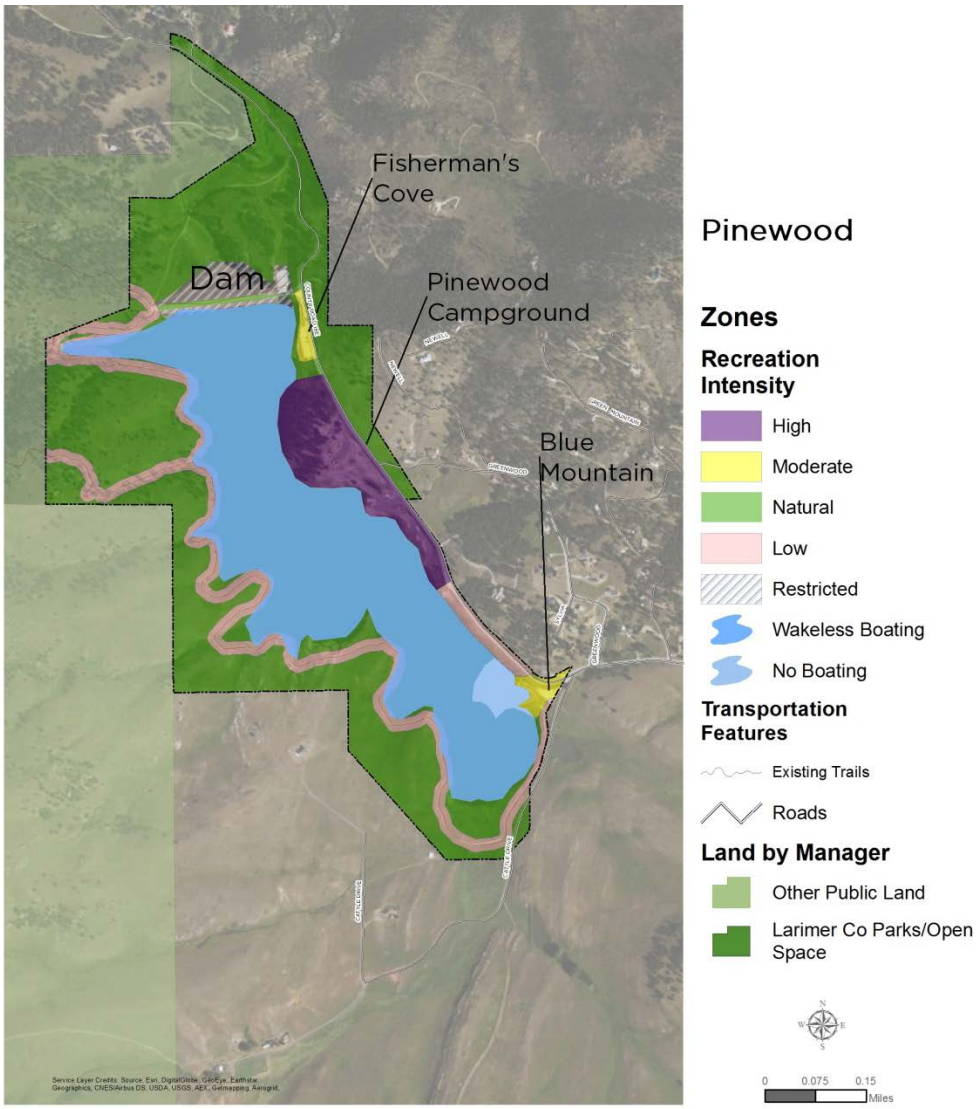
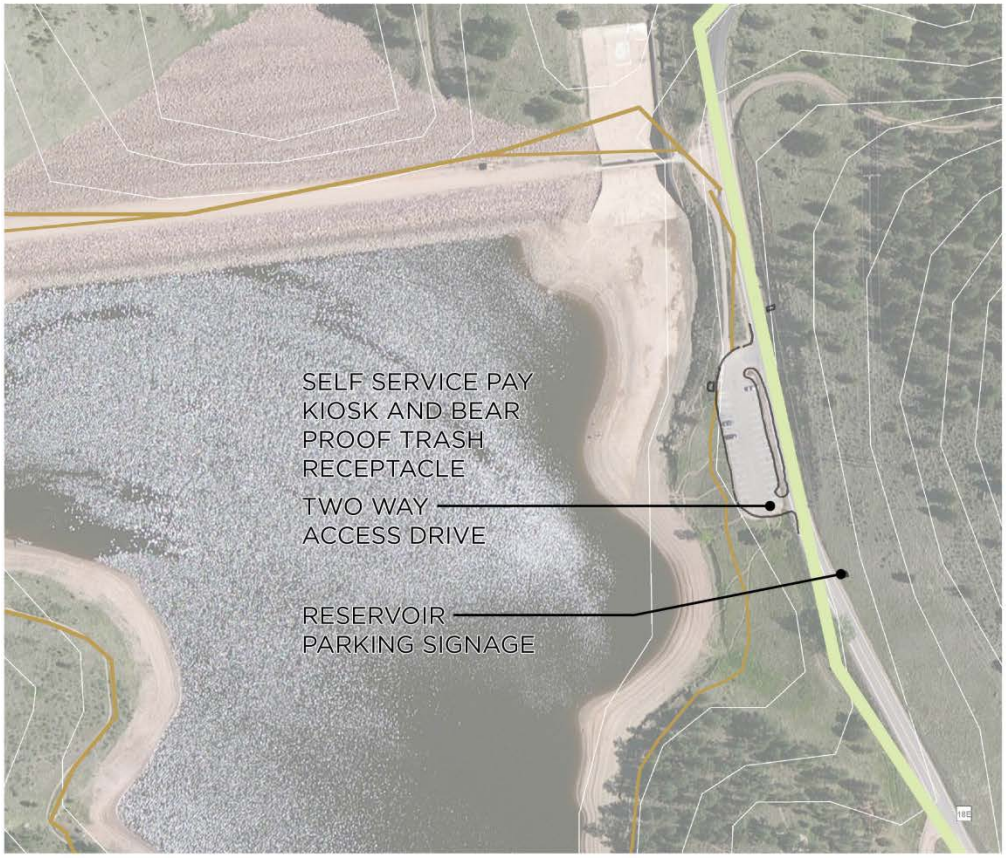


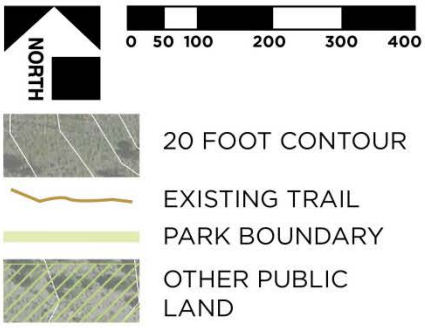
Figure 3.10 Fisherman's Cove Concept Plan



Fisherman's Cove

PROGRAM:

- Access on South End of Parking Lot
- 1-Automated Fee Kiosk
- Bear Proof Trash Receptacle
- Parking Directional Sign
- Neighborhood Traffic Only Sign
- Small Identification Sign



3.7.8 Flatiron Reservoir

Desired Visitor Experience (see Figure 3.11)

- Highly social and developed full-service camping adjacent to Flatiron Reservoir, including multiuse campsites – primary activity.
- Shoreline fishing opportunities.
- Picnicking in a scenic location.
- Group picnicking.
- Water Boating and swimming activities are prohibited.
- Trail use within the property, to the Natural Resource Administration Building.

Desired Managerial Conditions

- Provide a high level of safety through signage, visitor education, and limited staff presence.
- Manage for a high level of visitation and revenue.

New Development

Proposed improvements would upgrade the campground to a level of service similar to Pinewood Reservoir, with a focus on public safety. The improvements occur only within the existing developed area. Currently, Homeland Security issues prohibit recreation access near Reclamation inlet and outlet facilities on the northeast and southwest sides of Flatiron Reservoir, which obstructs establishment of the regional trail connections.

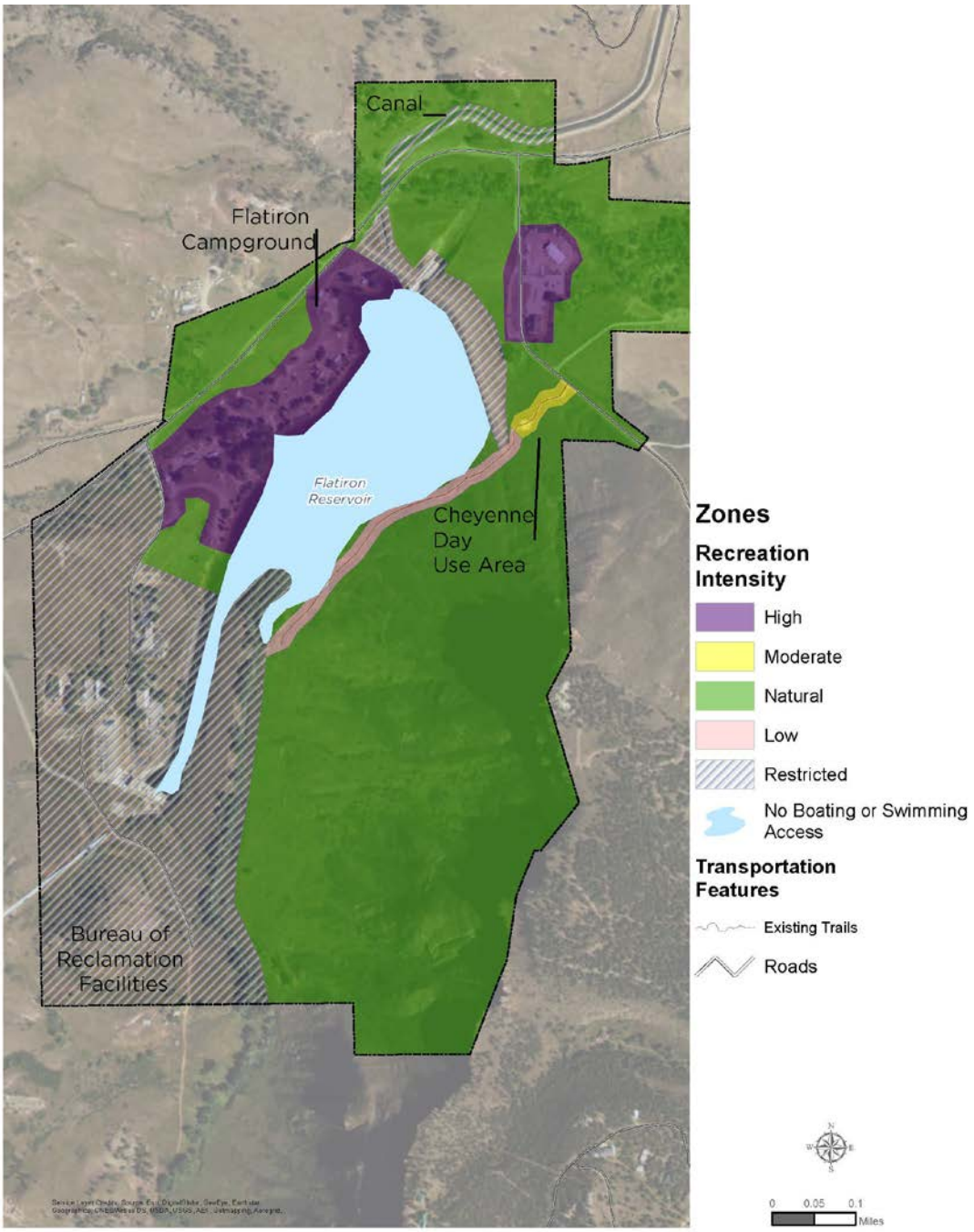
Campground/Day Use Area

- Update identification sign and kiosk area.
- Upgrade campground amenities.
- Improve group use area and campground education facility.
- Address flooding issues by upgrading culverts.
- Add additional signs for safety, explanation of why swimming is not allowed.
- Provide fishing etiquette signs.
- Improve pedestrian connection from Natural Resources Administration Building to Cheyenne Day Use Area.
- Evaluate ADA and ABA compliance and opportunities.

Gatehouse (near Natural Resources Administration Building)

- Upgrade the existing gatehouse with a standard design that provides ADA and ABA accessibility and an employee restroom.

Figure 3.11 Flatiron Reservoir Management Zones



3.8 Alternative Elements Eliminated from Consideration

Alternative actions identified during scoping considered but eliminated are described below by reservoir.

3.8.1 Horsetooth Reservoir

Inlet Bay Campground

- Adding a substantial number of additional campsites was considered infeasible due to a lack of suitable land and the challenges associated with creating land using fill.
- Relocating the Inlet Bay Trail off campground roads is dismissed due to the lack of a viable alternative.

Inlet Bay Marina

- Increasing the number of moorings/slips at Inlet Bay Marina was considered infeasible due to the regulatory challenges associated with deepening the marina area.

North of Horsetooth Dam

A range of alternative elements were explored and dismissed, as follows:

- Limited development, including a passive interpretive trail as the only feature, was considered infeasible as it would not generate revenue sufficient to cover capital and ongoing maintenance costs.
- A trail connection across CR 23 to the Reservoir Ridge Trailhead was considered unsafe due to the potential of vehicle-pedestrian conflicts.
- Disc golf course was unsupported as the site is not large enough; discs could land in the canal; and five disc golf courses already exist in adjacent Fort Collins.
- RV, cabin, tent, or group camping was unsupported due to compatibility with the character of the site and concerns from adjacent neighbors.

Satanka Bay

- Converting Satanka Bay or coves to non-motorized paddle sports only was considered infeasible due to demand for motorized boating.
- Relocating a paddle sports concessionaire from Satanka Bay to a cove with access via Lory State Park was determined infeasible due to road construction requirements and seasonal water level changes.
- Limiting the number of boats at one time in any one cove would create a difficult management challenge.
- Walk-in camping from Lory State Park to the coves was unsupported due to the unique recreational opportunity afforded to boat-in camping.
- A hiking trail from Satanka Bay to Lory State Park is not considered feasible at this time due to terrain (cliffs) and private land rights.

Blue Sky Trailhead

- Community interest in a playground was dismissed as it is not consistent with Reclamation policy.

Fort Collins Shuttle to Horsetooth Reservoir

- Not enough interest has been demonstrated to merit consideration at this time.

Other Trails

Multiple trail connections were considered that could assist in achieving a vision for Horsetooth Reservoir to connect to Fort Collins and Lory State Park without requiring on-street travel. The primary obstacles for most trail alignments are private land rights, terrain (cliffs), and natural resource conflicts. As stated under Section 3.5, Larimer County will work to acquire land or easements to complete trail connections on a willing seller basis. The County already has over 20 regional trails that it is working to accomplish, as described in the 2015 Open Lands Master Plan. The following trail segments were evaluated and dismissed below.

- An off-street, multi-use trail from Pineridge Natural Area to South Bay Campground paralleling CR 38E is not feasible at this time. The County will continue to investigate opportunities to work with other County Departments to improve bicycle access and public safety along CR 38E to Horsetooth Reservoir. Multiple potential trail alignments were examined with stakeholders and in the field and dismissed for the following reasons:
  - The high cost of retaining walls and trail construction on CR 38E due to steep terrain and boulders;
  - Safety concerns of increasing bike use on CR 38E;
  - Homeland Security risks to Spring Canyon Dam and monitoring equipment; and
  - Trail user compatibility with South Bay campground users.
- A protected pedestrian and/or bike path across each dam was dismissed as the road shoulder is sufficient to allow safe passage at all major dams.
- A southern trail connection from west Trilby along Western's transmission line access road to Bighorn Crossing Drive to South Bay is not feasible at this time due to private property and private road constraints.
- A loop trail from Pineridge Natural Area north of the Spring Canyon Dam to Piano Boulders to Dixon Reservoir was dismissed due to wildlife impacts and lack of support by agency partners.

3.8.2 Carter Lake

North Pines

- New and upgraded tent campsites were dismissed due to public support for additional day use areas.

Marina Area

- A full-service restaurant was considered infeasible due to water requirements that cannot be met at this time.

Big Thompson & Quarry Area

- Camping in the quarry area was dismissed due to demand for parking and concerns from adjacent property owners.
- Conversion of existing campsites to electric RV campsites at Big Thompson was dismissed due to demand for day use facilities.

Carter Knolls

- Retaining Carter Knolls to a day use area or group day use was dismissed due to high wind conditions.

Big Landia

- Cabins or RV camping were dismissed to conserve the character of the area.

South Shore Campground

- Tent camping below the high water mark was dismissed as it would create a difficult management challenge and potentially impact aquatic habitats.
- Boat-in camping along the west shore of Carter Lake was dismissed at this time due to potential conflicts with trail users and because boat-in camping is available at Horsetooth Reservoir.

3.8.3 Pinewood Reservoir

- New horse trailer parking at Fisherman's Cove or a new trailhead below the dam was dismissed at this time due to insufficient demand and space constraint at Fisherman's Cove parking area.
- A RV dump station would not be feasible at Pinewood. Visitors can use the Carter Lake dump station or private facilities.
- Cabins at Blue Mountain trailhead were dismissed due to insufficient demand.

3.8.4 Flatiron Reservoir

Campground

- Additional restrooms were requested by the public. This element was dismissed as the demand and need are not sufficient to warrant additional restrooms at this use area.
- Full RV hook ups were dismissed because it would not be consistent with level of service provided at this reservoir.
- Water recreation activities including but not limited to, swimming, wading, and boating of any type (including belly boats, kick boats, canoes, kayaks, and stand-up paddleboards) were dismissed due to a strong current and outlet siphon that creates unsafe conditions.
- A disc golf course was dismissed because it would not be consistent with the mission and role of the reservoir recreation area.
- A trail around the entire Flatiron Reservoir, connecting to both ends of the campground, was considered. This alternative element was eliminated because of Homeland Security and

public safety risks inherent to crossing the inlet canal and the trail's proximity to the Flatiron Powerplant.

Chapter 4 — Affected Environment and Environmental Consequences

4.1 Introduction

This chapter discusses the existing physical, biological and socioeconomic resources in the project area (affected environment) and the anticipated environmental effects (environmental consequences) of the alternatives considered. For most resources, the project area is defined as the lands and water within the boundaries of the four reservoirs. A broader area is considered for certain resources: e.g. socioeconomic resources, and where necessary to provide context.

The analysis of environmental consequences includes the application of the Standard Environmental Practices and Environmental Commitments described in Chapter 5, and the professional judgment of the resource specialists listed in Chapter 6. Where possible, impacts of each alternative are quantified; however, most impacts are discussed broadly due to the fact that specific project designs and construction details have not been fully defined. When developed, each site specific project designs and construction plans will be reviewed and approved to ensure consistency with the approved RMP and all applicable federal, state and local laws and regulations.

Cumulative impacts are defined by Reclamation as, "The impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Projects and activities considered in the cumulative effects analysis include:

- **Northern Integrated Supply Project (NISP) -**This project is still in the environmental review phase and the outcome of this review and the final project configuration cannot be identified with certainty at this point in time. However, as described in the Supplemental Draft EIS (2015), implementation of NISP would affect water levels at Horsetooth and Carter Lake (USACE 2015). These effects cannot be fully determined at this point in time. In general however, implementation of NISP would result in higher water levels at Horsetooth during the summer peak recreation use season. Water levels at Carter Lake would be less affected, but the result would be a slight lowering of water levels during the peak use season.
- **Grand County Water Quality/Clarity Study -** In 2008 the Colorado Water Quality Control Commission adopted a clarity standard for Grand Lake. In response to this standard, Reclamation is preparing an EA to evaluate various strategies to improve water quality in Grand Lake, Shadow Mountain Reservoir and Lake Granby without adversely affecting C-BT Project operations. Several alternatives will be evaluated, some of which could affect water levels in Horsetooth and Carter Lake. Long term effects cannot be addressed until the study is completed and a preferred strategy identified. Reclamation also entered into a MOU with Grand County, Northern Water, Northwest Colorado Council of Governments and Colorado River Water Conservation District in 2016 to

implement an adaptive management process through 2020 to improve clarity at Grand Lake while conducting NEPA for long term solutions (MOU No. 16-LM-60-2578).

- **Windy Gap and Windy Gap Firming Project -** These projects, being completed by Northern Water, can affect east slope reservoir levels when Windy Gap water is exchanged for C-BT Project water and delivered to entities within the Municipal Subdistrict of Northern Water. The Windy Gap Firming Project's proposed Chimney Hollow Reservoir is located near Carter Lake and its development would affect resources similar to those located in the project area. In addition, the project would provide new recreational opportunities, including non-motorized boating.
- **Other Water Contracts** - Reclamation has Excess Capacity Exchange Contracts with Loveland, Berthoud and Tri-Districts that have minor effects on Reservoir elevation in Horsetooth and Carter. Combined, these contracts have an effect on reservoir elevations.
- **Regional Growth -** The project is located in a rapidly growing area. This growth will likely influence resources at the four reservoirs and this effect is considered where appropriate.

The effects discussion in this chapter addresses direct, indirect and cumulative long-term effects resulting from the implementation of the alternatives during the 10-year RMP planning period. Any short-term effects from new projects would be related primarily to construction activities and would be temporary and minor. Short-term effects from construction would include noise, dust and use area or facility closures. These activities would result in minor disturbance to humans, recreational use and wildlife.

Figures 4.1-4.4 depict the existing resource conditions at each of the reservoirs.

4.2 Natural Resources

4.2.1 Hydrology and Water Quality

Affected Environment

The project area is located along the eastern slope of the Rocky Mountains, an area with a semi-arid climate zone characterized by strong seasonal variations in temperatures, abundant sunshine and relatively low precipitation. Average annual precipitation is approximately 15 inches with most precipitation received from April to September, often in the form of thunderstorms. Snowfall is approximately 50 inches per year but often melts quickly and is unreliable for skiing or other winter activities.

Table 4.1 summarizes some key characteristics of the four reservoirs.

Table 4.1 Characteristics of the Four Reservoirs in the Project Area

	Watershed Size (sq.mi.)	Max WS Elevation (feet)	Surface Area (acres)	Storage (acre-feet)
Horsetooth	17.5	5,430	2,040	156,735
Carter	19	5,759	1,114	112,228
Pinewood	3.5	6,580	97	2,179
Flatiron	7.0	5,472	44	722

Source: Reclamation Standard Operating Procedures, 2003-2005

Natural inflows to the reservoirs are from intermittent drainages, each of which contributes only a minimal amount of the water stored in the reservoirs. These include: Solider Canyon, Wells Gulch, Arthur's Rock Gulch, Mill Creek and Spring Creek at Horsetooth Reservoir; Dry Creek at Flatiron; Dry Creek (different from the Dry Creek located at Flatiron) at Carter Lake; and Mill Gulch at Pinewood Reservoir as well as several other unnamed drainages.

Pinewood Lake receives C-BT Project water from the west slope via the Olympus Tunnel and the Pole Hill Powerplant. Water is then delivered to Flatiron Powerplant and Flatiron Reservoir. Like Flatiron, Pinewood Reservoir water levels vary daily. Fluctuations of 3 to 4 feet are normal and are related to power generation needs.

Water is delivered to Flatiron Reservoir via the Bald Mountain Flatiron penstock originating at Pinewood Reservoir. Power is generated at the Flatiron Powerplant in the process. Water is delivered from Flatiron to either the Hansen Feeder Canal or (by pumping) to Carter Lake. Flatiron water levels can fluctuate by more than 10 feet over the course of a single day based on water demand and power generation.

Carter Lake and Horsetooth Reservoir are terminal storage points for the C-BT Project. Water is delivered to Carter Lake by pumping from Flatiron Reservoir from December through May. Water flows out from Carter Lake to the St. Vrain Canal for supplemental agricultural, domestic, municipal and industrial uses. Carter Lake exhibits a similar pattern to Horsetooth described below but fills earlier in an average year (late April to early May) and drops slightly by June before dropping sharply through the remainder of the summer. In an average year, the reservoir fills to 5,748.7 feet, drops 18.7 feet by July (5,730), an additional 21 feet in August (5,712.8) and reaches 5,703 feet by September. Over the course of the summer season, the reservoir drops by approximately 45 feet.

C-BT Project water is supplied to Horsetooth Reservoir via the Charles Hansen Feeder Canal, generally from October through May. Water stored in the reservoir is used to supplement municipal and industrial supplies on a year round basis. Water stored in Horsetooth Reservoir for agricultural uses is also supplemental, but is more seasonal and occurs primarily during the growing season. As a result, water levels in Horsetooth Reservoir fluctuate substantially on both a seasonal and annual basis. The following discussion of water levels is derived from Reclamation's Standard Operating Procedures (Reclamation 2003-2005): In an average year the reservoir fills in June and reaches a water surface elevation of approximately 5,412.5 feet. As demands for water stored in the reservoir increase, the water surface lowers, dropping by 10 feet

in July to 5,402.2 feet and by an additional 10 feet in August, reaching 5,392.2 feet. The reservoir continues to drop in September, reaching an elevation of 5,387.5 feet, which represents a drop of nearly 25 feet through the summer months. After October, when the reservoir drops to its lowest level (5,382.7 feet), the reservoir begins to fill and the water surface elevation rises throughout the winter and into the spring. In average dry years, the reservoir only fills to 5,415 feet and drops to approximately 5,387 feet by September. An average wet year results in slightly higher water surface elevations throughout the year, filling to 5,425 feet in June and dropping to 5,398 feet by September.

Water quality in the four reservoirs is generally considered to be “good”. This is due to the fact that source water is primarily derived from snow melt at high elevations and watersheds characterized by few contaminants and crystalline rock that provides for low dissolved solids content. The discussion that follows focuses on Horsetooth and Carter Lake. Water quality in Pinewood and Flatiron reservoirs is similar to that of the water inflowing from the CB-T System due to the fact that both reservoirs have short hydraulic detention times and frequent movement of water in and out of each reservoir (Northern Water 2013).

In addition to low dissolved solids, Horsetooth Reservoir has low levels of hardness, sodium, sulfate and nutrient concentrations (ammonia, nitrate, total phosphorus, orthophosphates). However, Horsetooth is on the 303(d) list for fish tissue, a listing that results from an elevated level of mercury in fish tissue found in some species taken from the reservoir. The reservoir is also on the list of impaired waters for copper and arsenic (Northern Water 2013)..

The trophic status of Horsetooth Reservoir has evolved from an oligotrophic (low nutrient levels) state in its early years to mesotrophic (moderate nutrient levels) today. A mesotrophic classification indicates moderately clear water and a loss of salmonoids (primarily salmon and trout) with species such as Walleye predominating. Carter Lake is considered oligotrophic, which indicates clear water, oxygen present in the hypolimnion (lower level of reservoir), and generally higher level of water quality than a mesotrophic reservoir. However, Carter Lake is also on the 303(d) list of impaired waters due to an elevated level of mercury in fish tissue found in some species taken from the reservoir.

Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

The No Action Alternative has no effect on reservoir hydrology. Reservoir elevations would continue to fluctuate based on the hydrologic year, the volume of West Slope water moved through the Adams Tunnel and water demands downstream of Horsetooth Reservoir and Carter Lake.

Although no additional areas would be disturbed by construction of new facilities, some additional areas would be disturbed by the anticipated increase in visitation. This increase, in combination with a continuation of current visitation management practices, could probably result in a minor increase in the amount of sediment reaching the reservoir. An increase in visitation would also present a risk of increased coliform bacteria levels in the reservoirs due to visitors not using the proper facilities.

Current capacity limits would remain in effect. Anticipated demand in boating use would likely result in increased use during periods of lower use, e.g. weekday mornings, when capacity limits do not directly affect boating numbers. Increasing the amount of paved areas that are currently unpaved would also result in minor increases in runoff of associated hydrocarbons and other fluids leaked from vehicles.

Impacts of the Proposed Action (Alternative B)

Like the No Action Alternative, the Proposed Action would have no effect on reservoir elevations. Increases in visitation are expected to occur, which could result in minor reductions in water quality. Continuation of boating capacity limits and the limited amount of new development planned at the four reservoirs would keep the degree of change minor.

Short term, minor impacts to water quality during construction under the Proposed Action would result from increased soil disturbance. Erosion and sediment control measures, spill control procedures and other measures will be implemented to minimize the risk of any contaminants reaching the four reservoirs (See Section 5.4.4). Areas disturbed by construction would be revegetated to reduce the potential for increased sediment and impacts on water quality.

Long term effects include an increased risk of contamination from human activities, including increased boating use. Although current capacity limits would remain in effect, the strong demand in boating use would likely result in increased use during periods of lower use, e.g. weekday mornings, when capacity limits do not directly affect boating numbers. Increasing the number of available parking spaces and paving areas that are currently unpaved would also result in minor increases in runoff of associated hydrocarbons and other fluids leaked from vehicles.

While the potential impacts to water quality under both the No Action and Action Alternatives are reduced with implementation of the standard environmental commitments described in Chapter 5, minor adverse effects on water quality may occur.

Cumulative Impacts

There are no hydrologic impacts associated with the No Action or Proposed Action. Therefore, there are no associated cumulative impacts to hydrology (reservoir elevations, etc.). Although other planned projects, e.g. NISP and the Grand County Water Quality/Clarity Study, might influence future water quality and reservoir operations at Horsetooth and Carter Lake, no cumulative impacts on water quality are anticipated. In the absence of any effects from project implementation, no cumulative effects would occur.

With respect to water surface elevations at the four reservoirs, the situation is more complex. Regional growth, increasing demands for water, and operation of NISP (if authorized and constructed within the life of this plan) are likely to modify operations at the four reservoirs with respect to the timing and extent of drawdowns. Because this RMP does not include reservoir operations, there are no cumulative effects on water levels. However, over the life of this plan Reclamation is likely to adjust reservoir operations in response to cumulative projects.

4.2.2 Geology, Soils, and Topography

Affected Environment

Geology

Horsetooth Reservoir and Carter Lake are located in a complex geologic setting that marks the transition zone between the Great Plains and the Rocky Mountains. Both reservoirs occupy topographic depressions within an inter-hogback valley. The “hogbacks,” which are the erosional remnants of great folds in the sedimentary layers, create a setting with strong visual interest. At Horsetooth Reservoir, several of the hogbacks have been penetrated by intermittent drainages. At high water, water reaches the west side of these hogbacks to form a series of protected coves along the shoreline.

The Lykins Formation is a potential geologic hazard at all four reservoirs due to its tendency to form sinkholes. Within the Lykins Formation sinkholes have the potential to develop near the surface. The Carter Lake Anticline is a local geologic feature that is a good example of folded sedimentary rock.

The only commercial mineral resources in the project area are the sandstone formations that were quarried in the past for building materials. Quarrying occurred at Horsetooth Reservoir and, to a lesser degree, at Carter Lake. No other commercial mineral resources are present in the project area and mineral extraction is no longer permitted in the project area.

Pinewood Reservoir is located in a geological setting that is markedly different from that of the other reservoirs. Several faults and diverse rock formations converge in the vicinity of the reservoir, resulting in a complex geological pattern where the Fountain and other sedimentary formations of the lower areas meet the intrusive igneous and metamorphic formations characteristic of the foothills. The reservoir itself is located at the edge of Rattlesnake Park, a flat area surrounded by several prominent peaks, including Bald and Blue Mountains.

Blue Mountain, which is located approximately one mile from Pinewood Reservoir, is a prominent landmark that has been designated as a Colorado Natural Areas Site. Blue Mountain is significant as an example of geologic faulting (Colorado Department of Natural Resources 2006).

Flatiron Reservoir is located in alluvium and colluvium deposits associated with the Dry Creek and Chimney Hollow drainages. The Fountain Formation makes up the surrounding land forms, including Flatiron Mountain with its steep rocky slopes and nearly vertical cliffs below the summit.

Soils

Many areas in the project area have sensitive soils, which usually reflect a combination of steep slopes and shallow depth to bedrock. The Natural Resource Conservation Service states that sensitive soils have severe limitations for recreational use and facility development: "A limitation of severe means that costly soil reclamation, special design, or intensive maintenance, or a combination of these is required.” Development of existing recreation areas and facilities has generally avoided locations with severe soil limitations.

Elevations at Horsetooth Reservoir range from 5,366 feet (low water line) to approximately 5,800 feet. The reservoir occupies the relatively flat areas between the hogback ridges, leaving a shoreline that laps up against the steep slopes of the hogbacks at most locations. The western shoreline is more varied and includes a series of coves that extend up the small valleys where drainages have eroded through the hogback ridge. The terrain is gentler at the upper end of these small valleys, such as Inlet Bay, where Spring Creek enters the reservoir. As a result, much of the recreation facility development at the reservoir has occurred at Inlet Bay and at the south end of the reservoir where the valley between the two hogbacks remains above the high water line. Small areas of gentle slopes occur along the tops of the hogback ridges.

Elevations at Carter Lake range from 5,477 feet to approximately 6,000 feet. Carter Lake also occupies a natural basin located between two parallel ridges in the foothills. The reservoir occupies the flat areas of the basin, resulting in a shoreline that abuts steep ridges along most of the east and west sides of the reservoir. As a result, much of the shoreline and adjacent land areas are steep and difficult to utilize for recreational activities or facility development. Only a few shoreline areas, including the South Shore and a small area at the northeast corner of the reservoir, are not limited by steep slopes. Several smaller areas, such as an area near the southeastern entrance along Dry Creek and the tops of some ridgelines, also have gentler slopes.

Pinewood Reservoir is located at nearly 6,600 feet, which makes it the highest of the four reservoirs. Steep topography abuts the shoreline along much of the northeast side of the reservoir adjacent to CR 18E, leaving only a few areas suitable for site development. Slopes are gentler in the southwestern portion where the reservoir abuts Rattlesnake Park; however, no public roads provide access to the western shoreline areas.

Although it has a small area, the Flatiron Reservoir site has substantial topographic variation, ranging in elevation from approximately 5,470 feet to over 6,100 feet near the summit of Flatiron Mountain. Much of the western portion of the site and shoreline are nearly flat, which is the area where recreation facilities have been developed and much of the use occurs. The southeast portion of the site is dominated by Flatiron Mountain, which rises abruptly from near the edge of the shoreline. This portion of the site is visually interesting and contributes to the visual quality of the setting.

Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

Under the No Action Alternative, existing geologic features would remain unchanged. No additional use areas would be developed and no new areas would be disturbed. Minor impacts to soil resources would continue to occur as a result of ongoing maintenance activities in addition to visitors using existing social trails, and trampling soils and vegetation in the vicinity of developed use areas and along the shoreline.

Impacts of the Proposed Action (Alternative B)

Approximately 66 acres would be disturbed by construction activities at new and expanded use areas. Most of the new disturbance would occur at Horsetooth Reservoir (47 acres) and a lesser amount at Carter Lake (18 acres). Less than an acre of disturbance would occur at Pinewood and

Flatiron reservoirs. The majority of disturbance resulting from implementation of the Proposed Action would occur within areas that are already disturbed. For example, at Horsetooth Reservoir construction of the new archery range and expanded trailer parking north of the dam would occur at locations that were heavily disturbed by prior construction activities and other uses. Similarly, some of the new construction at Carter Lake would occur within the footprint of existing use areas or in an area that had been previously disturbed by quarrying activities. Sensitive areas, such as the small pond at the proposed archery range at Horsetooth, would be protected from disturbance.

The best management practices listed in Chapter 5 would be implemented during operations of existing facilities and construction of areas disturbed outside of the footprint of new facilities, and use areas would be revegetated. As a result, only minor, increases in erosion and associated soil loss are anticipated in both the short term and long term.

Construction would not occur in areas of significant geologic features. If any structures are to be constructed in the Lykins Formation, a geotechnical evaluation would be performed to determine the risk of construction on or near sink holes.

Cumulative Impacts

No cumulative impacts have been identified for this resource.

4.2.3 Vegetation and Fire Management

Affected Environment

The project area is located within the Southern Rocky Mountain Steppe Ecoregion near the convergence of the Southern Rocky Mountain and Southern Rocky Mountain Foothills (United States Department of Agriculture 2016). Much of the project area lies at the lower end of the ecoregion, ranging from approximately 5,300 feet at Horsetooth Reservoir to 6,600 feet at Pinewood Reservoir. The landscape where these two regions meet is highly altered geologically, resulting in a diverse arrangement of plant communities due to variation in slope, aspect, elevation, precipitation, soil type, exposed bedrock and land use. Vegetation in the foothills region is an important resource, providing forage for native wildlife and habitat for rare and endangered plant species. Six Community types can be found within the project area. These include:

- Wetlands/Riparian
- Grassland
- Mixed shrubland
- Ponderosa pine/Mixed shrubland
- Ponderosa pine
- Disturbed/Developed areas

Wetlands/Riparian

Wetland and riparian community types are generally defined as wet habitats that occur along watercourses or adjacent to other water bodies. This community type is generally found as

depressions, broad areas associated with seepage from dams (Hansen Canal outlet north of Horsetooth Dam), narrow strips associated with intermittent and ephemeral drainages, broad flat areas that lack drainage outlets and narrow fringe areas around the perimeter of the four reservoirs at some locations. The unique soil conditions associated with these areas, largely due to the presence of water, led to the development of diverse vegetative communities that are important to many wildlife species. The U.S. Fish & Wildlife Service's (USFWS) National Wetland Inventory has identified three unique wetland types within the project area; including freshwater emergent wetlands, freshwater forested/shrub wetlands and riverine (USFWS 2016).

Common herbaceous species typically found in wetland and riparian areas include Baltic rush, sedges, redtop, goldenrod, field mint, curly dock and field horsetail. In areas where standing water occurs, water cress and broad-leaved cattail may also be found. Shrub species associated with riparian and wetland areas include coyote willow and the invasive species tamarisk, which is found in wetter areas. Chokecherry is found in areas that are somewhat drier. Tree species commonly found in wetland and riparian areas include plains cottonwood, narrowleaf cottonwood, peachleaf willow and the invasive species Russian olive.

Grasslands

Grassland plant communities are found in the valley bottoms and gentle side slopes. Soils in grassland areas are typically deeper than those of surrounding plant communities. Common herbaceous grass species typically found in grassland areas include needle-and-thread, blue grama, green needlegrass, western wheatgrass, indian ricegrass; and several introduced species, including smooth brome and crested wheatgrass. Grassland forb species include hairy golden aster, slender-flowered scurfpea, wild flax, prairie sage, scarlet globemallow and milkvetch. Other species that occasionally exist in grassland communities include broom snakeweed, fringed sage, prickly-pear cactus, yucca and Arkansas rose.

Mixed Shrubland

Mixed shrubland plant communities are found in areas with relatively steeper slopes than grasslands and typically have shallow, rocky soils. The dominant shrub in this community is mountain mahogany. Other shrub species found in the mixed shrub community include three-leaf sumac, squaw currant and western snowberry. An understory of herbaceous plant species may include needle-and-thread, blue grama, western wheatgrass, slender-flowered scurfpea and prairie coneflower. The invasive species, cheatgrass, may also be found growing in mixed shrubland areas that have been disturbed by past fire or overgrazing.

Ponderosa Pine/Mixed Shrubland

Ponderosa pine/mixed shrubland plant communities are found on moderately steep slopes with rocky shallow soils. This community can be found at a slightly higher elevation than the mixed shrubland community, although they can be integrated. Ponderosa pine is the dominant tree species of this community and mountain mahogany is the dominant shrub species. A diversity of plant species can be found in this community and include species such as blue grama, fringed sage, elk sedge, prairie sage, prickly-pear cactus and yucca.

Ponderosa Pine

The ponderosa pine plant community is similar to the ponderosa pine/mixed shrubland plant communities but has denser stands of ponderosa pine. This community is also found in areas of moderate slope with shallow rocky soils. Plant species found in this community are similar to those described for the Ponderosa pine/mixed shrubland community, with a lower component of shrubs and more herbaceous species.

Disturbed/Developed

Disturbed/Developed area plant communities are found near the dams as well as at locations near parking areas, campgrounds and trails where the native vegetation has been removed. Although weed control efforts are on-going, weed species are typically more common in these areas. Vegetation associated with disturbed/developed areas includes cheatgrass, Japanese brome, puncture vine, common mullein, peppergrass and Canada thistle. Some disturbed areas that have been revegetated in the past are dominated by smooth brome and/or crested wheatgrass.

Special Status Plant Species

A review of the USFWS web-based database indicates that four federally listed threatened or endangered species have the potential to occur in the project area (IPaC 2016). These species are:

- Colorado Butterfly Plant (Threatened)
- North Park Phacelia (Endangered)
- Ute Ladies'-tresses (Threatened)
- Western Prairie Fringed Orchid (Threatened)

Colorado Butterfly Plant is a short lived perennial forb that typically occurs on sub-irrigated, alluvial soils of drainage bottoms surrounded by mixed grass prairie (elevation range 5,000-6,400 feet) (Spackman et al. 1997). According to CNHP, the current estimated range in Colorado is 600,000 acres, however, occurrences in Larimer County are now considered historical and this species has possibly been extirpated (CNHP, 2004). Primary threats to the species include hydrologic alteration, broadleaf herbicide application and livestock grazing.

North Park Phacelia is found on poorly vegetated exposures of the Coalmont Formation in Jackson County, CO. These sites are characterized by steep-sided ravines, low sandy hills and bluffs (elevation range 8,000-8,500 feet). Habitat for this species does not occur in the project area. Primary threats include OHV use, habitat fragmentation and infrastructure associated with Oil & Gas development (CNHP 2011).

Ute Ladies'-tresses is a perennial orchid found in sub-irrigated alluvial soils along streams, open seepage areas in cottonwoods and moist meadows on floodplains (elevation range 4,500-7,700 feet) (Spackman et al. 1997). The current estimated range in Colorado is over 8,000,000 acres with known occurrences approximately 1 mile northeast of Horsetooth Reservoir in a wet meadow area surrounded by dry pasture land (CNHP 2004). Primary threats to the species include hydrologic alteration, seed predation and livestock grazing (CNHP 2011).

Western Prairie Fringed Orchid most often occurs in mesic to wet unplowed tallgrass prairies and meadows. However, this species has been found in old fields and road ditches (IPaC 2016).

No current or historical populations have been documented in Colorado. Primary threats include habitat loss, collection and pesticide application.

CNHP has also identified several special status species that could be potentially found in the project area (CNHP 2016). These species include (with their ranking and USGS Quad Element Location)[1]:

- Prairie Goldenrod (G5/S1), Horsetooth Reservoir
- Bell's Twinpod (G2G3/S2S3), Horsetooth Reservoir/Carter Lake/Masonville
- Slim-pod Venus'-looking-glass (G5/S1), Horsetooth Reservoir
- Rocky Mountain Phacelia (G3/SU), Horsetooth Reservoir
- Rocky Mountain Sedge (G5/S1), Horsetooth Reservoir
- Forktip Three-awn (G5/S1), Horsetooth Reservoir/Carter Lake
- Larimer Aletes (G2G3/S2S3), Pinewood Lake
- Gay-feather (G5/S2), Pinewood Lake
- Southern Rocky Mountain Cinquefoil (G3/S2), Pinewood Lake
- Large Water-Starwart (G5/S1), Masonville
- Blue Giant-hyssop (G4G5/S1), Masonville
- Jeweled Blazingstar (G3/S3), Masonville

CNHP Potential Conservation Areas

CNHP has delineated potential conservation areas that focus on capturing the ecological processes necessary to support continued existence of rare elements (species) or suites of rare elements (CNHP 2016). The following potential conservation areas (PCAs) are located within or partially within the project area:

[1] This list does not include CNHP ranked species that are also Federally listed or Colorado state listed.

Definition of Colorado Natural Heritage Program Imperilment Ranks.

G/S1=Critically imperiled globally/state because of rarity (5 or fewer occurrences in the world/state; or 1,000 or fewer individuals), or because some factor of its biology makes it especially vulnerable to extinction.

G/S2=Imperiled globally/state because of rarity (6 to 20 occurrences, or 1,000 to 3,000 individuals), or because other factors demonstrably make it very vulnerable to extinction throughout its range.

G/S3=Vulnerable through its range or found locally in a restricted range (21 to 100 occurrences, or 3,000 to 10,000 individuals).

G/S4=Apparently secure globally/state, though it may be quite rare in parts of its range, especially at the periphery. Usually more than 100 occurrences and 10,000 individuals.

G/S5=Demonstrably secure globally/state, though it may be quite rare in parts of its range, especially at the periphery.

- Green Ridge PCA
- Carter Lake Reservoir Hogbacks PCA
- Rattlesnake Park PCA
- Indian Creek Hogback PCA
- Horsetooth Reservoir Hogbacks PCA
- Redstone Creek Cliffs PCA
- Dixon Creek PCA

Table 4.2 lists these areas and provides additional information on each.

The Green Ridge PCA covers a large portion of south central Larimer County, totaling 68,471 acres in size and occupying the transition zone between the foothills and montane regions that span the Front Range (elevation range 5,400-9,550 feet). The Green Ridge PCA is located just west of Carter Reservoir, capturing Pinewood Reservoir within its boundary, and extends to the north primarily in the higher elevation zone around the Big Thompson River. The site includes two occurrences of the globally imperiled (G2) ponderosa pine/mountain mahogany/big bluestem savanna, known only on the Front Range north of Boulder, CO (CNHP, 2004).

The Carter Lake Reservoir Hogbacks PCA is located on the hogback immediately west of Carter Lake (elevation range 5,670-6,230 feet). The site contains fair occurrences of two globally imperiled (G2) plant communities, including the ponderosa pine/mountain mahogany/big bluestem foothills woodland that is only known to occur in northern Colorado's Front Range and mountain mahogany/New Mexico feathergrass foothills shrubland (CNHP 2004).

The Rattlesnake Park PCA is found on the south side of Pinewood Reservoir along intermittent drainages that flow into the reservoir (elevation range 6,600-6,900 feet). The site contains thousands of Southern Rocky Mountain cinquefoil plants that occur along the intermittent drainages, making it an excellent (A) occurrence of the globally vulnerable plant (CNHP 2004).

The Indian Creek Hogback PCA includes approximately six miles of the hogback ridge, from just north of Devil's Backbone to Horsetooth Reservoir's Inlet Bay (elevation range 5,400-5,800 feet). The site is characterized by the red sandstone hogback cliffs that provide unique habitat to populations of mountain mahogany and a variety of native grasses. Bells twinpod (G2) is found in patches throughout the PCA, typically growing from the base of the cliff's to the toe of the slopes (CNHP 2004). Management issues identified on the site include the invasion of noxious weeds and trail placement.

The Horsetooth Reservoir Hogbacks PCA is located west of Fort Collins, Colorado in the area surrounding Horsetooth Reservoir. Bell's twinpod (G2) occurs on the site, as well as historical records of prairie goldenrod and forktip three-awn grass (CNHP 2004). The site also contains the globally imperiled (G2) ponderosa pine/mountain mahogany/big bluestem foothills woodland community, big bluestem-little bluestem xeric tallgrass prairie community, mountain mahogany/three-leaf sumac/big bluestem foothills shrubland, and globally imperiled (G2G3) mountain mahogany/New Mexico feathergrass foothills shrubland (CNHP 2004).

The Redstone Creek Cliffs PCA is a 1,025 acre site located between the Horsetooth Mountain Open Space parking lot and Redstone Canyon Road (elevation range 5,500-6,000 feet). The diverse topography in the area allows for large variation in plant communities and vegetative cover. The site also contains two fair occurrences of Bell's twinpod (G2), known only to occur on the foothills of the Front Range (CNHP 2004).

The Dixon Creek PCA extends along five miles of the Niobrara shale formation between the City of Fort Collin's Pineridge and Coyote Ridge natural areas. The site has two good and one fair occurrence of Bell's twinpod (G2). The site also contains a fair occurrence of the globally imperiled (G2G3) mountain mahogany/New Mexico feathergrass shrubland.

Table 4.2 Potential Conservation Areas and Associated Rankings

Name	Biodiversity Significance Rank	Protection Urgency Rank	Management Urgency Rank	Within Project Area	Within 1 Mile Buffer
Green Ridge	Very High	Definable Threat/ Opportunity but not within 5 years	Needed within 5 years to Maintain Quality	Yes (Pinewood)	Yes (Carter, Pinewood, and Flatiron)
Carter Lake Reservoir Hogbacks	High	Threat/ Opportunity within 5 years	Essential within 5 years to Prevent Loss	Yes (Carter)	Yes (Carter)
Rattlesnake Park	High	No Threat or Special Opportunity	Not Needed Now; No Current Threats; May Need in Future	Yes (Pinewood)	Yes (Pinewood)
Indian Creek Hogback	Very High	No Threat or Special Opportunity	Needed within 5 years to Maintain Quality	Yes (Horsetooth)	Yes (Horsetooth)
Horsetooth Reservoir Hogbacks	Very High	No Threat of Special Opportunity	Needed within 5 years to Maintain Quality	Yes (Horsetooth)	Yes (Horsetooth)
Redstone Creek Cliffs	High	Definable Threat/Opportunity but not within 5 Years	Needed within 5 years to Maintain Quality	No	Yes (Horsetooth)
Dixon Creek	Very High	No Threat or Special Opportunity	Needed within 5 Years to Maintain Quality	No	Yes (Horsetooth)

Source: CNHP 2016

Weeds

The diverse terrain, adjacent seed sources, and recreational use of the project area provides the potential for numerous weed species to become established. The Colorado State Noxious Weed Act (Title 35, Article 5.5, Colorado Revised Statues) lists 71 weed species considered to be a threat to the economy and the environment. Another 24 species are on the state's watch list. The

Larimer County Noxious Weed Management Plan requires eradication of all List A species, as mandated by the state, and containment and suppression measures for 16 of the List B species identified as significantly troublesome (Larimer County 2008). List A species are of highest priority because they are not well established in Colorado but potentially a large problem to the state, requiring mandatory eradication. There are seven List A species in Larimer County:

- Yellow starthistle
- Mediterranena sage
- Myrtle spurge
- Cypress spurge
- Orange hawkweed
- Purple loosestrife
- Knotweeds

Weeds identified as List B species, those recommended for eradication but common enough that statewide eradication is not possible, include:

- Bull thistle
- Canada thistle
- Common teasel
- Dalmatian toadflax
- Diffuse knapweed
- Hoary alyssum
- Hoary cress
- Houndstongue
- Leafy spurge
- Musk thistle
- Perennial pepperweed
- Russian knapweed
- Scotch thistle
- Spotted knapweed
- Tamarisk or saltcedar
- Yellow toadflax

Other weed species reported to be present in small or isolated populations within Larimer County include black henbane, bouncingbet, Chinese clematis, common tansy, dames rocket, Eurasian watermilfoil, jointed goatgrass, moth mullein, oxeye daisy, plumeless thistle, Russian olive, salt cedar, sulfur cinquefoil, wild caraway, and yellow nutsedge (Colorado Department of Agriculture Weedlist 2016). Noxious weeds are actively treated in the project area by the Larimer County Weed District, U.S. Forest Service, and other agencies using the approved Integrated Pest Management Plan including chemical, mechanical, and biological control methods.

Fire Management

Fire management activities such as thinning and fuels treatments, fire potential mapping and suppression are is achieved by multiple agencies through agreements and partnerships. Reclamation implements a fire management plan that includes the four reservoirs. Reclamation is also a partner in the C-BT Headwaters Partnership with Northern Water, CSFS, U.S. Forest Service, Larimer County, and Rocky Mountain National Park. Larimer County also maintains a fire management plan and uses methods such as thinning and fuels treatments, fire potential mapping, and suppression. Fire protection for public safety is provided by local fire protection

districts, including the Poudre Fire Authority, Loveland Fire Rescue Authority, and the Berthoud Fire Department.

The 2012 High Park wildfire that burned 87,000 acres in Larimer County, and was followed by severe flooding in 2013, will likely increase active fire management and recovery projects in the project area.

Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

Under the No Action Alternative, the existing vegetation and plant communities, including sensitive species and conservation areas, would remain unchanged. No additional use areas would be developed. The extent of informal use areas and social trails could increase in response to the growth in visitation and some additional vegetation would likely be disturbed. This adverse effect would be negligible and long term with the existing RMP in place. The No Action Alternative is predicted to have no effect on threatened or endangered plant species.

Impacts of the Proposed Action (Alternative B)

The Proposed Action would affect primarily two communities including grasslands and shrublands. Most of the impacts to vegetation would occur within or adjacent to areas that have previously been developed or that have been disturbed in the past. A total of approximately 66 acres would be disturbed by construction activities at new and expanded use areas. Most of the disturbance to vegetation would occur at Horsetooth Reservoir (47 acres) and a lesser amount at Carter Lake (19 acres). Less than an acre of disturbance would occur at Pinewood and Flatiron reservoirs.

Of the 47 acres of that would be disturbed at Horsetooth Reservoir, the great majority of disturbance would occur within areas that are already disturbed. The new archery range would be located within a disturbed grassland area. This use area accounts for approximately 31 acres of the total area that would be disturbed. Sensitive areas, such as the small pond and small drainage, would be protected from disturbance. The expanded trailer parking north of the dam would be located almost entirely within an area of existing disturbance. Only a minor amount of new disturbance would result from trail construction (2 acres). Most of the trail construction would occur within a combination of disturbed area and shrubland.

Similarly, some of the new construction at Carter Lake would occur within the footprint of existing use areas or in an area that had been previously disturbed by quarrying activities. An exception to this statement is the new development planned at Big Landia, which would result in the disturbance of approximately 15 acres of undisturbed grassland. Other development activities along the shoreline north of Dam 2 would result in the disturbance of approximately 4 acres.

Other long term impacts to vegetation would occur due to trampling, or the collection of woody material for fuel.

Wetland and riparian areas and the associated federally listed species, Ute Ladies'-tresses and Colorado Butterfly Plant, are not anticipated to be impacted as no development would occur in

these areas. No CNHP potential conservation areas or other sensitive plant species would be directly affected.

The potential for the spread or the introduction of weeds is present in all areas to be developed and would be controlled by methods described in the County's Integrated Pest Management plan. The potential for wildfire would not be measurably affected by the Proposed Action.

The need for additional fire protection would be in response to increased visitation, however, this additional need is not considered significant given the low intensity of development and the few buildings proposed. Overall, impacts to vegetation would be minor in both the short and long term.

Cumulative Impacts

Other planned projects, including NISP and Chimney Hollow, would result in the loss of vegetation communities similar to those affected by the Proposed Action. The small amount of vegetation loss associated with implementation of the Proposed Action would increase the total amount of vegetation and result in a minor cumulative effect.

Figure 4.1 Horsetooth Existing Conditions

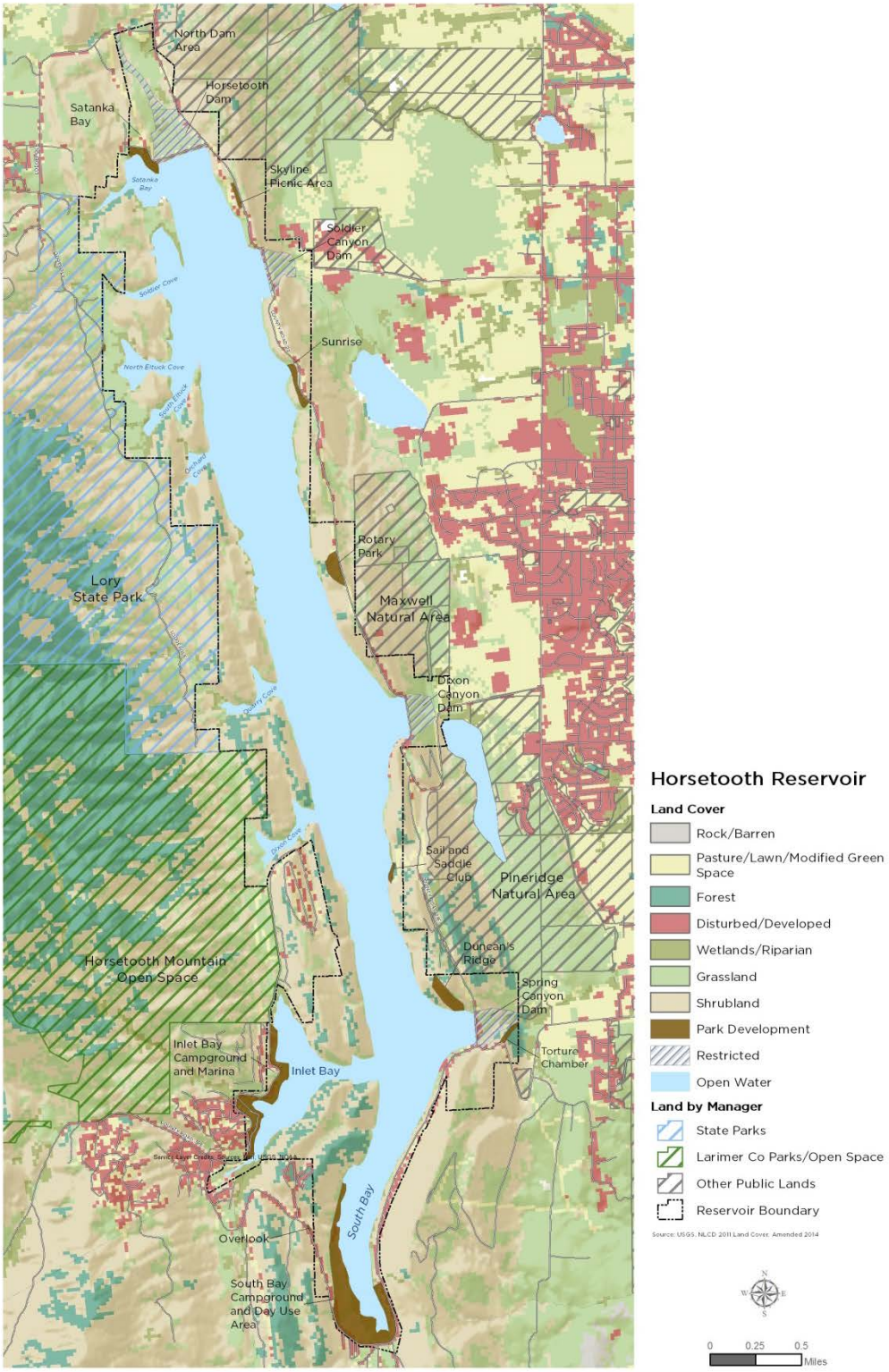


Figure 4.2 Carter Existing Conditions

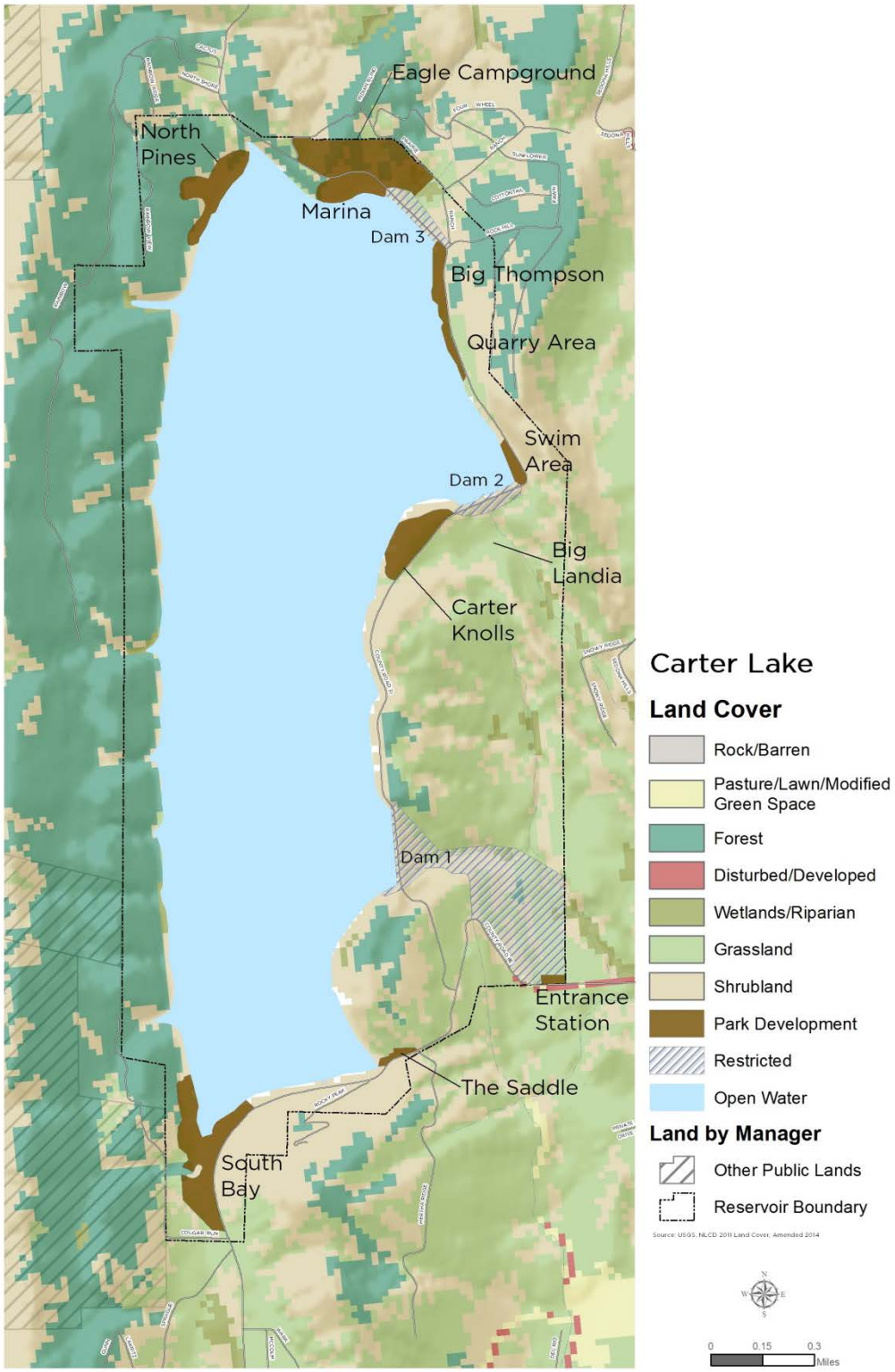


Figure 4.3 Pinewood Existing Conditions

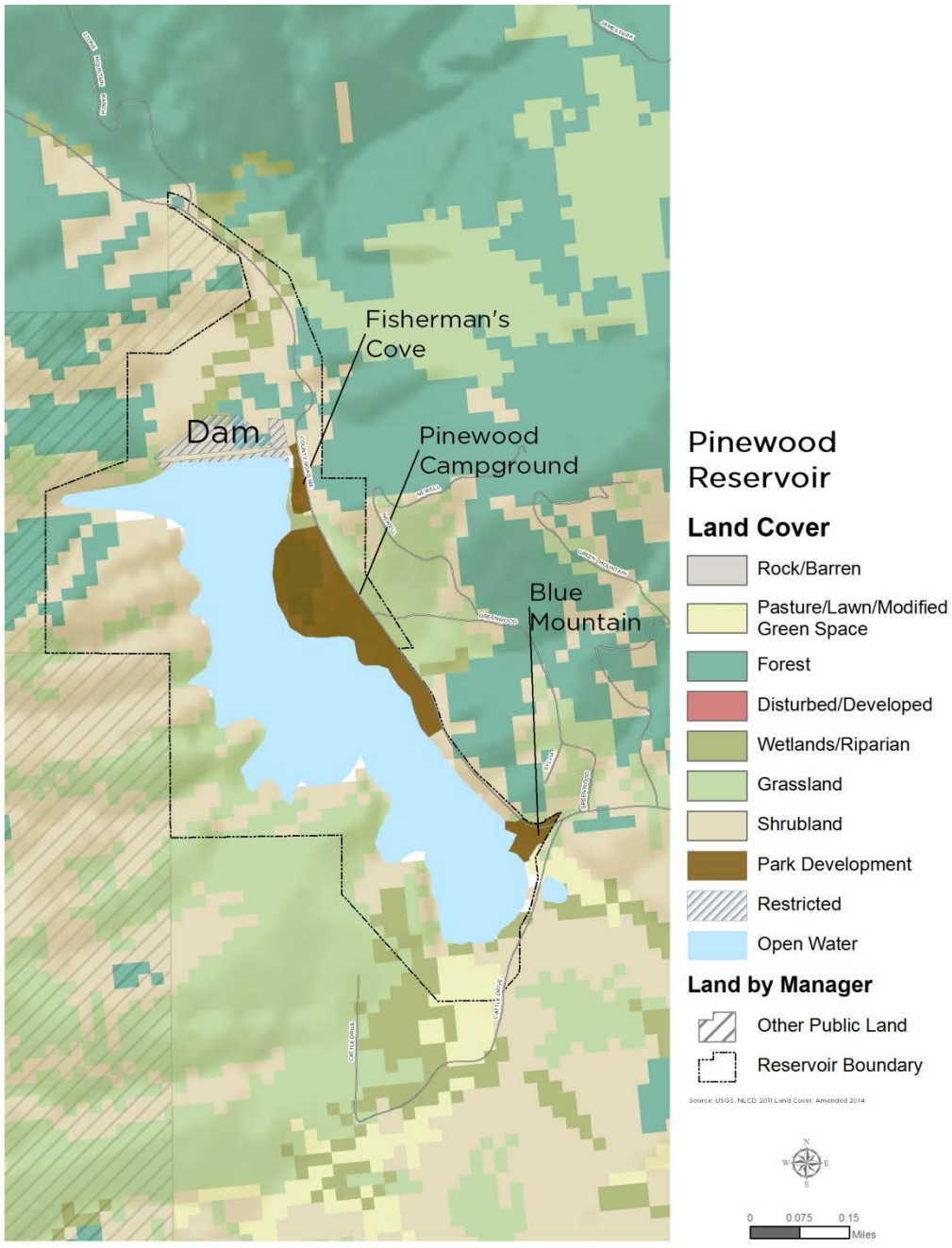
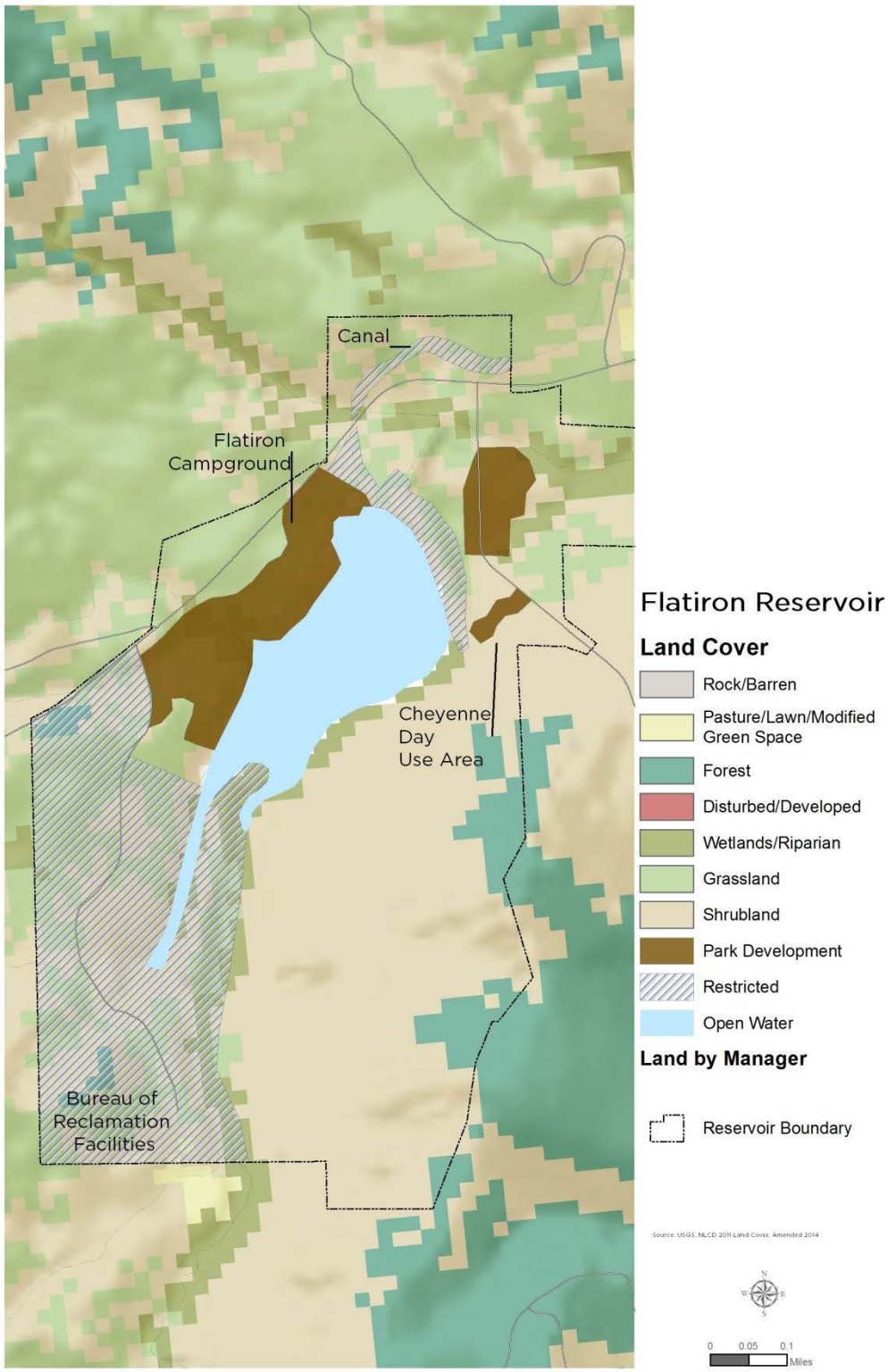


Figure 4.4 Flatiron Existing Conditions



4.2.4 Fish and Wildlife

Affected Environment

Wildlife Resources

A variety of wildlife species occur within and adjacent to the lands surrounding the four reservoirs, including several species of big game, small mammals, and migratory birds. Each of these groups of species is discussed briefly in the remainder of this section, followed by an overview of threatened and endangered and other sensitive species.

Large Game

Large game, including deer, elk, mountain lion, and black bear are known to occur on project lands. No important migratory corridors or routes cross project lands. All four reservoirs are mapped by CPW as overall range for mule deer and a concentration area for this species occurs just south of Horsetooth Reservoir and extends nearly all the way to the Larimer/Boulder County line, thus encompassing both Carter Lake and Flatiron Reservoir (CPW 2016). Pinewood Reservoir is not within the mapped concentration area. The reservoirs also provide important winter range for mule deer, including areas mapped as both severe winter range and winter concentration areas. Excluding Pinewood, the reservoirs also provide habitat for white-tailed deer. The north end of Horsetooth Reservoir is mapped as severe winter range and winter concentration area for white-tailed deer and a winter concentration area extends nearly the length of the reservoir along its western boundary, reaching the shoreline near some of the coves.

Elk habitat also encompasses all four reservoirs and some project lands provide important elk winter range. Winter range, including both severe winter range and winter concentration areas, is mapped in an area that encompasses Carter Lake, Pinewood, and Flatiron reservoirs. No elk production areas occur at any of the four reservoirs.

None of the reservoirs provide suitable habitat for bighorn sheep or moose.

All four reservoirs are mapped as overall habitat for black bear and most project lands are mapped as a fall concentration area. However, the fall concentration area includes only the western and northern portion of land at Carter Lake. In addition, project lands at Horsetooth Reservoir are mapped as a summer concentration area for black bears.

Lands surrounding the reservoirs also support populations of mountain lion. This species preys mainly on deer and elk and typically inhabits rocky outcroppings and ridges near the foothills.

Other Wildlife

In addition to the big game species previously discussed, project lands support a variety of other species, including coyote, red fox, raccoon, bobcat and porcupine. Smaller mammal species are likely to include cottontail rabbit, deer mouse and northern pocket gopher. Common amphibians and reptiles are likely to occur on project lands, including species such as bullsnake, prairie rattlesnake and Woodhouse toad.

Migratory Birds and Raptors

Nearly all bird species potentially present in the project area are protected under the MBTA. Bald eagles, which were down listed from a federally threatened species in August 2007, are still protected under the MBTA and the Bald and Golden Eagle Protection Act. The bald eagle is discussed later in this chapter under Colorado Special Status Species. In addition to common songbirds, such as the American robin, eastern kingbird, western meadowlark and others, project lands provide habitat for great blue heron, golden eagles and a variety of other raptors, such as red-tailed hawk. No great blue heron nesting areas are known to occur at the reservoirs; however, all four reservoirs are mapped as foraging areas for this species. Similarly, no golden eagle nests are known to occur at the reservoirs but the lands surrounding them are likely foraging areas for this species.

Fisheries Resources

The reservoirs support a fairly diverse mix of nonnative game species and a smaller number of nonnative and native forage species. At Horsetooth Reservoir, rainbow trout, smallmouth bass, walleye, and white sucker are common species, though rainbow trout have become less abundant in recent years. Populations of smallmouth bass and walleye have remained relatively stable. Other species include brown trout (which has become rare), gizzard shad, yellow splake, crappie and bluegill (USACE 2015). Carter Lake supports a similar mix of species, but it is known for its trophy walleye and rainbow trout, as well as largemouth bass. Table 4.3 lists the fish species documented to be present.

Pinewood Reservoir has a less diverse fishery but species stocked there include several trout species as well as tiger muskie. Tiger muskie, a hybrid species between northern pike and muskellunge, are stocked annually and is renowned as a sport fish because it can reach sizes over 50 inches long. Fishermen are allowed a take limit of one tiger muskie greater than 36” per day.

Flatiron Reservoir is a put-and-take fishery that is heavily stocked with catchable trout.

Ice fishing is prohibited on all four reservoirs due to the fluctuating water levels that can lead to unsafe conditions, restricting winter fishing opportunities to open waters. Motorized boats are allowed on Horsetooth, Carter, and Pinewood reservoirs while Flatiron Reservoir does not allow boating.

Table 4.3 Species Reported to be Present at in Project Area

Common Name	Horsetooth 2016	Carter 2016	Flatiron 2016	Pinewood 2016
Black crappie	X			
Bluegill	X	X		
Brown trout	X		X	X
Common carp	X			
Cutbow trout	X	X	X	
Cutthroat trout (native)	X			
Green sunfish		X		
Lake trout		X		
Largemouth bass	X	X		
Rainbow trout	X	X	X	X
Snake River cutthroat trout		X		
Splake	X	X		
Smallmouth bass	X			
Tiger muskie				X
Walleye	X	X		
Yellow perch	X	X		

Source: CPW 2016a

Federally Listed Species

The United States Fish & Wildlife Service has recorded the occurrence or potential habitat of wildlife species that are in danger of extinction throughout all or a significant portion of their range (endangered), or are likely to become an endangered species within the foreseeable future (threatened) within the project area. These federally protected species require additional environmental considerations and are listed in Table 4.4 (IPaC 2016). Since the project doesn't involve any additional water depletions, those species listed in Table 4.4 with an asterisk are not discussed further.

Table 4.4 Federal Listed Wildlife Species with Habitat or the Potential to Occur in Larimer County, Colorado

Common Name	Federal Status	Habitat or Known to Occur in Larimer County
*Least Tern**	Endangered	yes
Mexican Spotted Owl	Threatened	yes
*Piping Plover**	Threatened	yes
*Whooping Crane**	Endangered	yes
Black-footed Ferret	Endangered	yes
Canada Lynx	Threatened	yes
Preble's Meadow Jumping Mouse	Threatened	yes
Greenback Cutthroat Trout	Threatened	yes
*Pallid Sturgeon**	Endangered	yes

Source: IPaC 2016
** Water depletions in the North Platte, South Platte, and Laramie River Basins may affect listed species in Nebraska*

Mexican Spotted Owl – Mexican spotted owls are a federally and state threatened species that inhabit canyon and montane forest habitats across a long range that extends from Colorado to Mexico. Although no critical habitat for this species exists in the project area the USFWS has identified the potential for occurrence (IPaC 2016).

Black-Footed Ferret – This species is limited to open grasslands and is closely associated with the occurrence of prairie dogs. It has been estimated that about 40-60 hectares of prairie dog colony are needed to support one ferret. In the absence of any documented prairie dog colonies in the project area, it is doubtful that suitable habitat for the black-footed ferret is present at any of the four reservoirs.

Canada Lynx – Canada lynx are a federally threatened and state endangered species with potential habitat within the project area. After being extirpated from Colorado in the late 1970's, CPW launched a reintroduction program in 1999 by relocating 218 animals captured in Canada and Alaska back to the state. In 2010, CPW declared the reintroduction a success with an estimated 150-250 lynx living and successfully breeding within the state. Typical habitat includes dense subalpine forests and willow corridors along streams where high densities of prey exist. However, this species is known to travel long distances and utilize a variety of habitat types. Given the habitat types present at the four reservoirs, any occurrences of this species is likely to be incidental.

Preble's Meadow Jumping Mouse – The Preble's meadow jumping mouse is a federally threatened, state threatened and critically imperiled CNHP species with both occupied and potential habitat within the project area. Typical habitat is comprised of well-developed plains and riparian vegetation with a relatively dense composition of grasses, forbs and shrubs; as well as adjacent, relatively undisturbed, grassland communities and a nearby water source. Preble's meadow jumping mouse are known to regularly range outward into adjacent uplands to feed and hibernate. There are three known populations (occupied range) that exist within the project area

(CPW 2016). Two are located at Horsetooth Reservoir in the Arthur's Rock Gulch, as well as a small tributary of the gulch, and shoreline of Orchard Cove areas. The third is located at Flatiron Reservoir and occupies the entire reservoir shoreline and nearby riparian zones (specifically along Cottonwood Creek which Flatiron feeds into). All four reservoirs lie within overall range of the Preble's meadow jumping mouse indicating potential habitat exists throughout the project area.

Greenback Cutthroat Trout – Greenback cutthroat trout (Greenbacks) are a federally and state threatened coldwater species. Greenbacks prefer cold, clear, gravely headwater streams and mountain lakes that provide an abundant food supply of insects (CPW 2016). Due to extensive hybridization, genetically pure populations of Greenbacks only exist in small isolated areas outside of the project area. However, CPW is culturing these fish in the hatchery system and reintroducing them to their native waters, giving the potential to occupy the project area in the future.

Colorado Special Status Species

CPW has identified priority species and habitats that need conservation efforts specific to the state. These species, designated as special status in the approved state wildlife action plan, also require additional consideration (CPW 2016). These species are discussed below, excluding those species already discussed due to their federal listing status.

Mammals

The species listed in Table 4.5 are state special status species that may occur in the project area.

Table 4.5 CPW State Special Status Mammal Species with Potential to Occur in Project Area

Common Name	State Status	Habitat or Known to Occur in Project Area
Black Tailed Prairie Dog	State Special Concern	yes
Northern Pocket Gopher	State Special Concern	yes
River Otter	State Threatened	yes
Townsend's Big Eared Bat	State Special Concern	yes

Source: CPW 2016

Black-tailed Prairie Dog – Black-tailed prairie dogs are a state species of concern and CNHP vulnerable species that form large colonies or "towns" in shortgrass and mixed prairie habitats. While the overall range of the species lies within the project area, no colonies are known to exist within the project area (CPW 2016).

Northern Pocket Gopher – Northern pocket gophers are a state species of concern with an overall range that encompasses the project area. Typical habitat includes deep soils along streams, meadows and cultivated fields, but they are known to exist under many other conditions. Northern pocket gophers serve as prey for owls, hawks, foxes, bullsnakes, rattlesnakes and other wildlife known to exist in the project area.

River Otter – River otters are a state threatened species with the potential to occur within the project area. They can thrive in any water habitat (such as ponds, marshes, lakes and rivers) as long as there are adequate food sources. River otter dens are found along the water edges in abandoned burrows and empty hollows with underwater entrances so they can be accessed easily.

Townsend's Big Eared Bat – Townsend's big eared bats (Townsend's) are a state species of concern and imperiled (CNHP) species that occupy semi-desert shrublands, pinyon-juniper woodlands, and open montane forests (as well as mines, caves and structures located within these habitat types). Townsend's do not make major migrations and are relatively sedentary. Hibernacula are characterized by low and stable temperatures, sometimes with moderate airflow and are generally occupied from late October to April.

Birds

The project area contains suitable habitat for raptor nesting as well as breeding habitat for a variety of localized and migratory bird species. Table 4.6 lists special status species that may occur in the project area, which are further described below. In addition, the CPW species activity mapping has identified the project area as having overall range for Canada geese, great blue herons, osprey, ring-necked pheasants, white pelicans and wild turkeys within the project area (CPW 2016).

Table 4.6 CPW State Special Status Bird Species with Potential to Occur in Project Area

Common Name	State Status
American Peregrine Falcon	State Special Concern
Bald Eagle	State Special Concern
Burrowing Owl	State Threatened
Ferruginous Hawk	State Special Concern
Least Tern	State Endangered

Source: CPW 2016

American Peregrine Falcon – American peregrine falcons are a species of state concern that nest on cliffs and forage over adjacent coniferous and riparian forests. Migrants and winter residents occur mostly around reservoirs, rivers, and marshes, but may be seen in grasslands, agricultural areas, and other habitats. In Colorado, they are rare spring and fall migrants in western valleys, foothills, lower mountains, mountain parks and on eastern plains. They are also rare summer residents in foothills and lower mountains; and very rare winter residents on eastern plains near foothills (NDIS 2006).

Bald Eagle – Bald eagles are a species of state concern with known winter and overall range, a roost site, summer forage and winter forage habitat within the project area (CPW 2016). Breeding habitat for bald eagles consists of forested areas near large bodies of water. Nests are typically placed in tops of tall trees located near suitable foraging habitat. Winter habitats occur along major river systems and along eastern and western North American coasts. Roosting habitat consists of tall trees that offer protection from prevailing winds and are generally located near aquatic foraging areas. Most roosting sites for bald eagles in western North America are in

coniferous (or sometimes riparian) trees. The documented roost site within the project area is located in Lory State Park near Horsetooth Reservoir (CPW 2016). Wintering bald eagles are regularly observed within the vicinity of the reservoirs.

Burrowing Owl – Burrowing owls are a state threatened species that are found in or near prairie dog towns. The burrowing owl is a spring and summer resident and is found most commonly in eastern Colorado (NDIS 2006). Habitat is quite variable and ranges from areas that are relatively undisturbed mixed-grass prairie and rangelands to areas in residential developments. The absence of prairie dog colonies makes the occurrences of this species unlikely in the project area.

Ferruginous Hawk – Ferruginous hawks are a species of state concern known to inhabit grasslands and semi-desert shrublands; with rare occurrences documented in pinyon-juniper woodlands. Breeding birds nest in isolated trees, rock outcrops, structures such as power poles or on the ground. Winter residents concentrate around prairie dog colonies. Winter numbers and distribution fluctuate greatly depending on the availability of prairie dogs; when a local prairie dog population dies off due to plague, hawk numbers decrease drastically. Migrants and winter residents may also occur in shrublands and on agricultural areas on eastern plains.

Reptiles and Amphibians

Table 4.7 lists state special status species that may occur in the project area.

Table 4.7 CPW State Special Status Amphibian and Reptile Species in Project Area

Common Name	State Status
Northern Leopard Frog	State Special Concern
Wood Frog	State Special Concern
Common Garter Snake	State Special Concern

Source: CPW 2016

Northern Leopard Frog – This species occupies a variety of aquatic habitats, including slow-moving or still water along streams and rivers, wetlands, permanent or temporary pools, beaver ponds and human-constructed habitats, such as earthen stock tanks and borrow pits. Although these habitats are limited within the project area, it's possible that the northern leopard frog is present at one or more of the reservoir sites.

Wood Frog – Wood frogs inhabit various kinds of wooded habitats, including the edges of ponds and streams and willow thickets and grass/willow/aspen associations. These habitats are rare within the project area and important habitat for this species is unlikely to be present.

Common Garter Snake – Common garter snakes are a widely distributed species that can be found throughout North America and have been identified as a species of state concern in Colorado. Habitat can vary greatly but typically is found in forests, fields and prairies; as well as streams, wetlands, meadows, marshes and ponds. Common garter snakes are often found in close proximity to water and have an overall range that spans the project area.

Fish

The majority of special status fish species within the state of Colorado exist primarily in flowing waters and natural lakes. The project area does not contain any documented populations. There are two species with suitable habitat that have the potential to be present. Species listed in Table 4.8 are discussed below, excluding those species already discussed due to their federal listing status.

Table 4.8 CPW State Special Status Fish Species with Potential to Occur in Project Area

Common Name	State Status
Colorado River Cutthroat Trout	State Special Concern
Iowa Darter	State Special Concern
Lake Chub	State Endangered

Source: CPW 2016

Colorado River Cutthroat Trout – This species is currently limited to a few small headwater streams of the Green and upper Colorado rivers in Colorado, Utah and Wyoming. No genetically pure occurrences of this species are known to occur within the project area.

Iowa Darter – Iowa darter is a species of state concern that is found throughout the Front Range of Colorado in streams and ponds. They are known to exist in the Arapaho-Roosevelt National Forest and have the potential to exist within the project area. Typical habitat includes clear to lightly turbid water in small cool lakes, bogs, ponds and slow-moving rivers; they are primarily associated with submerged vegetation.

Lake Chub – Lake Chub are a state threatened species that has the potential to exist within the project area. They are most commonly found in lakes but can also live in streams and rivers with adults moving to deeper waters in mid-summer to avoid the warmer water temperatures associated with lake shores during this time.

Environmental Consequences

No Action Alternative (Alternative A)

Effects on wildlife resources under the No Action Alternative would reflect the impacts of anticipated increased visitor use. While no habitat would be removed, use of the shoreline for recreational purposes would result in increased habitat degradation, especially in more heavily used areas. These effects would be long term and minor.

The effects of the No Action Alternative on fisheries would be a continuation of the existing conditions. Over time, visitation is expected to increase and demands on the fishery would be greater. To maintain a fishery of similar quality and makeup to what presently exists, current fishery management practices may need to be modified (e.g. stocking, catch limits). Other naturally reproducing populations would continue to reproduce, but their numbers would diminish without implementation of a stocking regime for these species.

Impacts of the Proposed Action (Alternative B)

The small amount of additional disturbance and avoidance of sensitive habitats would result in only minor impacts on wildlife. The majority of the disturbance (approximately 66 acres) would occur in areas that have been previously disturbed and that have lower habitat values. Small areas of shrubland and grassland would be disturbed but most of this disturbance would occur in areas that are adjacent to previous disturbances and/or existing development.

No effect to any threatened, endangered or special status species is anticipated. The Proposed Action would not result in direct disturbance to habitat for any federally listed species. Several of the listed species (see Table 4.3), including the least tern, piping plover, whooping crane, and pallid sturgeon, are listed only in reference to projects that could result in water depletions that may affect listed species in Nebraska. The Proposed Action would not result in any water depletions. Suitable habitat for other listed species, including the Mexican spotted owl, black-footed ferret, Canada lynx, and greenback cutthroat, is not located at any of the reservoirs. Only the Preble's meadow jumping mouse has been documented as occurring in the project area and no disturbance of known or potential habitat for this species would result from implementation of the Proposed Action.

In addition, no known raptors nests or roost sites would be directly affected. Effects to wildlife resulting from increasing visitation would also occur. Increased human presence, additional vehicle traffic, and dispersed recreational activities would produce more disturbances to wildlife, including increased vehicle- related mortalities and wildlife harassment. Construction of the trail from Carter Lake to Chimney Hollow would occur during the summer months in order to avoid wintering elk populations. Overall, adverse impacts on wildlife would be long term and minor.

Similar to the No Action Alternative, growth in visitation could increase fishing pressure which could lead to increased harvests affecting the population of some species.

Cumulative Impacts

Although several projects were identified in Section 4.1 that could result in cumulative effects, cumulative impacts on this resource would be negligible. The small amount of habitat disturbance resulting from the Proposed Action and lack of adverse impacts on wildlife would not augment the impacts identified for each of individual projects considered.

4.3 Visitor Experience

4.3.1 Recreation

Affected Environment

Recreation at the four reservoirs is managed by Larimer County and includes both land- and water-based activities. This section includes an overview of recreational activities and facilities, visitation and participation rates, and an analysis of recreation trends.

Recreational Activities

The primary activity at Horsetooth Reservoir is motorized boating, including wake boarding, tubing, water-skiing, fishing, and jet-skiing. Boats can be launched from South Bay, Inlet Bay or Satanka Cove on the north end of the reservoir. The Inlet Bay Marina has 250 slips and 50 moorings, and there is currently a wait list for slips at the marina. Swimming, fishing, and paddle sports are also popular day-use activities as are picnicking, hiking and mountain biking. Hunting is not currently permitted. The east side of the reservoir features renowned rock climbing and bouldering opportunities. The west side coves are designated wakeless areas and offer excellent fishing, camping, and paddling opportunities. Two large campgrounds are located at the south end of the reservoir. There are 53 campsites at Inlet Bay and 85 campsites at South Bay for a total of 138 sites.

Motorized boating is also one of the most popular activities at Carter Lake; however, the reservoir also provides some of the better opportunities for sail boating that occur along the Front Range. The entire eastern shoreline is designated as a wakeless zone. The north and south ends of the reservoir receive the most intensive use; these use areas consist of boat launches, day use areas, campgrounds, and the marina. The marina has 100 slips and 80 moorings and there are 50 slips available through the Sail Club at North Pines. There are 52 campsites at the South Shore area, 7 at Carter Knolls, 8 at Big Thompson, 8 at North Pines and 49 campsites at Eagle Campground for a total of 124 campsites.

Pinewood Reservoir is open to wakeless boating only. Pinewood Reservoir offers the most natural experience of the four reservoirs. Use and visitation levels are typically less intensive than the other reservoirs, which is primarily a function of the reservoir's location, size, water temperatures, and management policies. The most popular activities are fishing from non-motorized boats such as kayaks and canoes, and camping. Fisherman's Cove at the northwest end of the reservoir is an especially popular fishing spot, and is accessible by foot only. The Rattlesnake dam is open to foot traffic and provides fishing access to the west shoreline. There are a total of 31 campsites at Pinewood.

Flatiron Reservoir is also less intensively used than Horsetooth and Carter Lake. The user population at Flatiron Reservoir is historically comprised of an older population base that prefers RV camping to tent camping. A total of 37 camp sites are available. Because of safety concerns relating to water level fluctuations, no boating or swimming is allowed at this site. The most popular recreation activities are fishing from shore, picnicking, and camping. Fishing opportunities are accessible from the campground and from the day use areas on the north side of

the reservoir. Another day use area (Cheyenne) is located along the south side of the reservoir and accessible via CR 31.

A complete inventory of recreation facilities by reservoir and site is provided in Table 4.10.

Visitation & Participation

While no formal visitation studies have recently been completed, annual passes and day use permits are tracked on an annual basis. Total annual visitation for 2016 at all of the reservoirs is estimated to be approximately between 650,000 and 1.4 million. Visitation was estimated by multiplying day use permits by an average group size and annual passes by a typical visitation rates and the average group size. Based on a study from CPW on visitation at state parks, which have similar visitation patterns, the average group size is 2.84 people. From the same study, average annual visits at reservoir parks within the Colorado State Parks system range between 10.97 visits at Boyd Lake State Park to 42.38 visits at Chatfield State Park. Boyd Lake is a comparable example based on size, location, and types of uses (CPW 2009). Total visitation to the four reservoirs is estimated between 650,000 and 1.4 million annually. Additional information on visitation is provided in Table 4.9 and Table 4.10.

Table 4.9 Estimated Visitation by Day and Annual Passes

Day Permits			
	*Total Day Permits Sold**	*Group Size+*	*Total Visitors (Day Permits)*
2016	140,163	2.84	398,063
2015	135,505	2.84	384,834
2014	120,485	2.84	342,177
2013	106,215	2.84	301,651
2012	85,995	2.84	244,226

Annual Passes					
	*Total Annual Passes Sold**	*Annual Visit Times (Low)+*	*Annual Visit Times (High)+*	*Group Size+*	*Total Visitors (Annual Passes)*
2016	8,470	10.97	42.38	2.84	263,881 - 1,019,442
2015	7,752	10.97	42.38	2.84	241,512 - 933,025
2014	6,983	10.97	42.38	2.84	217,554 - 840,468
2013	5,108	10.97	42.38	2.84	159,139 - 614,795
2012	8,547	10.97	42.38	2.84	266,280 - 1,028,710
*Source: *Larimer County 2017, +CPW 2009*					

Table 4.10 Inventory of Existing Facilities

	Sky Trailhea	Inlet Bay Marina	Inlet Bay Campgr	Inlet Bay Campgr	Bay Day Use	Bay Campgr	tration/ Mainten	Sunrise Day Use Area	Skyline Day Use Area	Satanka Bay	Rotary Day Use Area	Saddle Club	West Shorelin	oun Reservoi r	Marina	Eagle Campgr	North Pines Area	Thomps on Campgr	North Entranc	East Entranc	s Area Swim Beach - Dam 2	Carter Knolls	& Fawn Hollow	South Shore Area	Carter Lake Total	Blue Mountai n Area	Campgr ound &	an's Cove	d Reservoi r	Reservoi r
Entrance station	0	1	0	0	0	1	0	0	0	0	0	0	0	**2**	0	0	0	0	1	1	0	0	0	0	**2**	0	0	0	**0**	**1**
Self-serve fee collection station	1	1	0	0	1	0	0	1		1	1	0	0	**6**	0	0	0	0	1	1	0	0	0	0	**2**	0	0	0	**0**	**1**
Picnic area	0	1	0		1	0	0	1	1	1	1	0	0	**7**	1	1	1	0	0	0	0	1	0	1	**5**	0	0	2	**2**	**1**
Individual picnic shelters	1	1	0	0		1	0	2	0	0	0	0	0	**2**	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	**0**	**4**
Reservable group picnic shelter	0	0	0	0	1	0	0	1	0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	1	**1**	0	0	0	**0**	**1**
Total campsites	0	0	26	27	0	88	0	0	0	0	0	0	15	**156**	0	49	4	8	0	0	0	7	0	52	**120**	0	27	0	**27**	**36**
Basic campsite (non- electric)	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	4	8	0	0	0	7	0	0	**19**		11	0	**11**	**0**
Electric campsite	0	0	26	27	0	60	0	0	0	0	0	0	0	**113**	0	49	0	0	0	0	0	0	0	46	**95**	0	16	0	**16**	**33**
Walk-in campsite (sub set of basic campsite)	0	0	0	0	0	4	0	0	0	0	0	0	0	**4**	0	0	4	0	0	0	0	2	0	6	**12**	0	11	0	**11**	**3***
Full hook-up	0	0	0	0	0	17	0	0	0	0	0	0	0	**17**	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	**0**	**0**
ADA electric campsite (sub set of electric or hook up campsites)	0	0	2	2	0	3	0	0	0	0	0	0	0	**7**	0	3	0	0	0	0	0	0	0	3	**2**	0	0	0	**0**	**1**
Cabin	0	0	0	0	0	7	0	0	0	0	0	0	0	**7**	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	**0**	**0**
Backcountry/Boat-in campsites	0	0	0	0	0	0	0	0	0	0	0	0	15	**15**	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	**0**	**0**
Swim Area	0	0	0	0	1	0	0	1	0	0	0	0	0	**2**	0	0	0	0	0	0	1	0	0	0	**1**	0	0	0	**0**	**0**
Disabled accessible fishing pier	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	**0**	**1**
Car parking spaces	52	194	0	18	93	20	8	88	30	40	63	15	0	**511**	10	25	30	5	0	0	62	8	20	60	**220**	20	21	15	**56**	**40**
Trailer parking spaces	4	100	0	0	150	40	0	0	0	40	0	0	0	**334**	4	35	56	0	0	0	0	0	0	35	**130**	0	10	0	**10**	**0**
Vault toilet	1	2	4	4	3	5	0	4	2	2	2	0	3	**32**	0	3	2	1	0	0	1	1	1	3	**13**	1	3	0	**4**	**3**
Flush toilet	0	0	1	0	1	1	1	0	0	0	0	0	0	**4**	1	1	0	0	0	0	0	0	0	1	**3**	0	0	0	**0**	**0**
Potable water	0	2	3	3	3	12	3	0	0	0	0	0	0	**26**	0	3	0	0	0	1	0	0	0	0	**2**	1	4	0	**5**	**1**
Drinking fountain	0	2	2	2	2	6	0	0	0	0	0	0	0	**14**	0	3	2	1	0	0	0	0	0	0	**6**	0	1	0	**1**	**3**
Dumpster	1	9	3	3	4	1	4	2	1	2	1	0	0	**32**	2	6	4	2	0	1	1	2	1	9	**29**	1	3	1	**5**	**8**
Sanitary dump station	0	0	1	0	0	1	0	0	0	0	0	0	0	**2**	0	0	0	0	0	1	0	0	0	0	**1**	0	0	0	**0**	**0**
Boat ramp	0	1	0	0	3	0	0	0	0	1	0	1	0	**6**	1	0	1	0	0	0	0	0	0	1	**3**	0	1	0	**1**	**0**
Dock	0	3	0	0	1	0	0	0	0	1	0	0	0	**5**	2	0	2	0	0	0	0	0	0	1	**5**	0	0	0	**0**	**0**
Marina	0	1	0	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**0**	**0**
Boat slips/moorings	0	300	0	0	0	0	0	0	0	0	0	15	0	**315**	180	0	50	0	0	0	0	0	0	0	**190**	0	0	0	**0**	**0**
Boat/sewage pump station	0	1	0	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**0**	**0**
Gas	0	1	0	0	0	0	1	0	0	0	0	0	0	**2**	1	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**0**	**0**
Boat rental	0	1	0	0	0	0	0	0	0	1	0	0	0	**2**	1	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**0**	**0**
Food concession	0	1	0	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**0**	**0**

*Source: Reclamation Recreation Use Data Report, Part I and II, FY 2016 and Larimer County *Walk-in Site are Tipis*

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Table 4.11 Annual Permits Sold by Location

	2016	2015	2014	2013	2012	2011
Horsetooth Reservoir	3,374	3,056	2,598	1,978	2,915	3,666
Carter Lake District (Carter & Flatiron Gatehouse & Natural Resources Admin)	2,201	2,115	1,981	763	1,305	1,264
Other (Outside Vendors, Citizen's Information Center, and Online Sales)	2,895	2,581	2,404	2,367	3,863	3,712
Total	**8,470**	**7,752**	**6,983**	**5,108**	**8,083**	**8,642**

Source: Larimer County 2017

Boating vessel capacities at Horsetooth Reservoir and Carter Lake are influenced by water levels. Currently, boating capacity is limited by the number of parking spots available to boat trailers. The following capacities (boats at one time) have been established by Larimer County for each of the four reservoirs under full water conditions:

- Horsetooth—380 boats
- Carter—189 boats
- Pinewood—16 boats
- Flatiron—no boat access

Demand for water stored in Horsetooth and Carter Lake is greatest during the prime recreation season, June through August. Reservoir levels fluctuate widely. (See Section 4.2.1 Hydrology for more details.) At Horsetooth and Carter Lake, areas near the high water shorelines become isolated from the water edge at lower water levels. For example, at Horsetooth the drawdown nearly dries up the southern end of South Bay and the water recedes several hundred feet in other areas by the end of the summer. A similar pattern in water levels occurs at Carter Lake.

According to the 2014 Colorado SCORP, 13.3 percent of the state's population participated in power boating annually and 36.4 percent participate in fishing (all types) (State of Colorado 2014). On average 59,000 boats go through ANS boat inspections every year at Horsetooth and Carter (See Table 4.12). These numbers do not account for the number boats that leave from the marinas.

Table 4.12 Aquatic Nuisance Species Boating Inspections

Year	Total Inspections	Decontaminations
2016	59,500	1,325
2015	59,946	1,256
2014	54,555	258
2013	60,219	212
2012	49,741	217
2011	61,489	271

Source: Larimer County 2017

Recreational use varies seasonally and throughout the week; however, there is a growing trend of more use during the shoulder seasons and during the week. The heaviest use, approximately 80 percent, continues to occur on the weekends and holidays between late May and early September.

Camping is available at all four of the reservoirs. Camping accommodations ranges from full RV hook-ups to walk-in tent sites. Horsetooth Reservoir also offers boat-in camping along the western edge of the reservoir and cabins at the South Bay Campground. A complete inventory of camping sites by campground at each reservoir is provided in Table 4.10.

Camping reservations are highest during the peak season, between Memorial Day and Labor Day. Occupancy rates continue to rise for all seasons, with the late shoulder season and off seasons showing strong increases in occupancy.

Table 4.13 provides occupancy rates for all four reservoirs over the past 5 years.

As part of this planning process, Larimer County conducted an informal, online questionnaire to determine level of satisfaction, use patterns, issues and desired experiences (Reclamation 2016). Hiking, mountain biking, swimming, picnicking, motorized boating, and fishing are the most popular activities. Overall, visitors have expressed the need for additional swimming/swim beach areas, mountain biking, hiking, snowshoeing, and additional restaurants/concessionaires at the four reservoirs. Additional educational programming for youth was also desired.

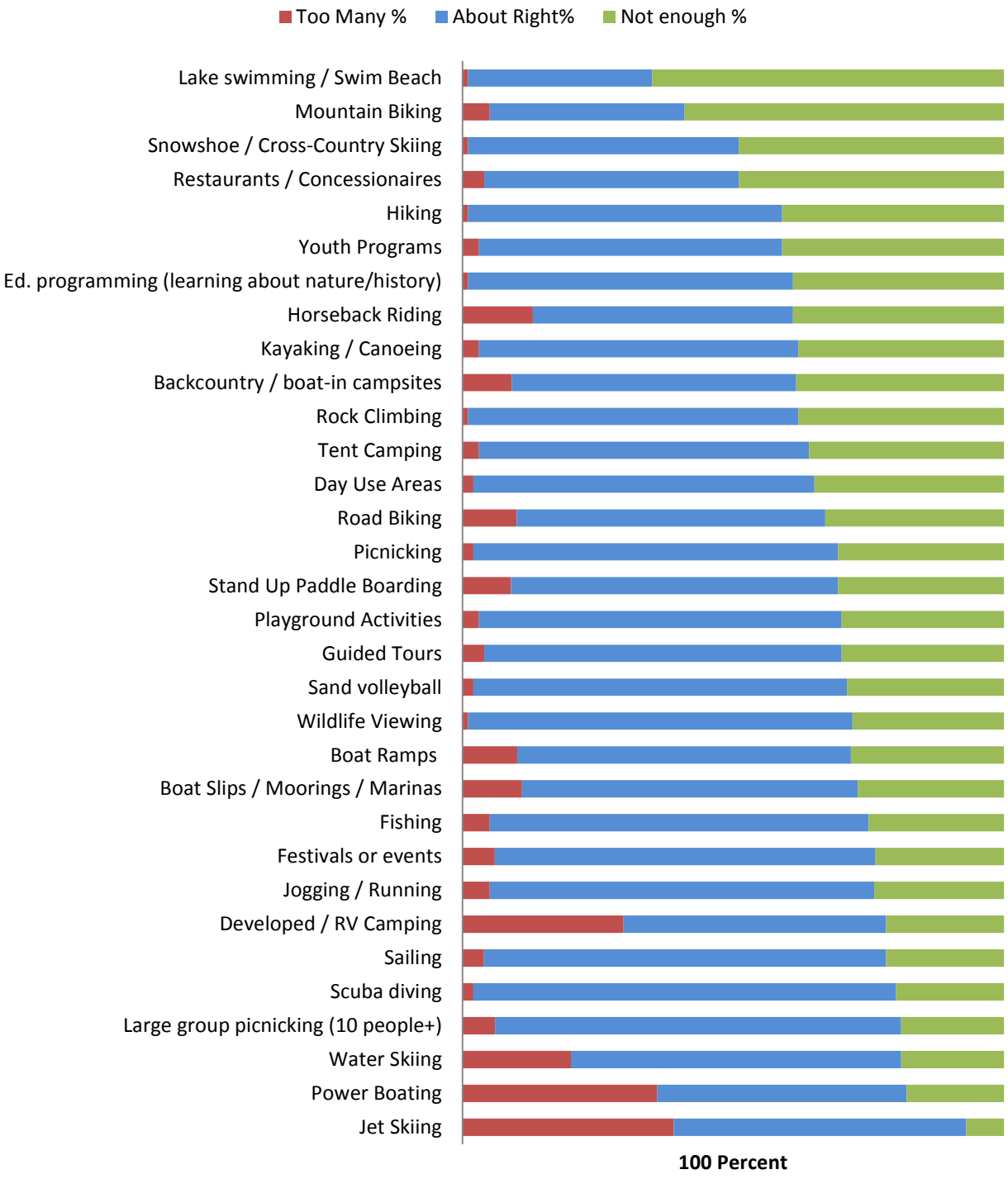
Figure 4.5 illustrates the desire for more activities at the reservoirs.

Table 4.13 Reservable Camping Sites by Reservoir

	Reservation Nights					Occupancy Rate				
Year	Annual Quantity	Peak (Memorial - Labor Day)	Early Shoulder (April 1-Memorial Day)	Late Shoulder (Labor day -Oct 31)	Off Season (Nov 1-Mar 31)	Annual	Peak (Memorial - Labor Day)	Early Shoulder (April 1-Memorial Day)	Late Shoulder (Labor day -Oct 31)	Off Season (Nov 1-Mar 31)
Horsetooth										
2016	21,158	12,621	3,382	3,508	1,647	49%	87%	40%	44%	13%
2015	19,730	12,816	2,652	3,117	1,145	51%	82%	34%	43%	14%
2014	17,156	11,243	2,363	3,072	478	42%	77%	29%	37%	5%
2013	12,961	9,527	1,680	1,563	191	36%	65%	20%	20%	4%
2012	9,099	6,639	1,656	601	203	26%	49%	21%	11%	3%
2011	9,843	7,201	1,214	1,302	126	29%	54%	16%	18%	2%
Carter Lake										
2016	11,391	6,835	2,074	2,000	482	40%	74%	37%	37%	6%
2015	10,547	6,746	1,642	1,772	387	36%	67%	32%	35%	4%
2014	9,232	5,731	1,521	1,691	289	32%	60%	30%	31%	3%
2013	7,492	5,248	1,190	951	103	No Data	No Data	No Data	No Data	No Data
2012	6,095	4,173	1,043	830	49	24%	44%	20%	15%	1%
2011	5,801	4,209	791	797	4	24%	45%	14%	15%	0%
Pinewood										
2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016
2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013
2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012
Flatiron										
2016	4,298	2,335	792	863	308	34%	66%	40%	43%	6%
2015	3,997	2,382	526	806	283	33%	63%	32%	43%	6%
2014	3,652	2,025	641	786	200	29%	57%	34%	37%	4%
2013	3,411	2,152	585	539	135	38%	66%	32%	28%	7%
2012	2,650	1,608	532	475	35	22%	50%	29%	25%	1%
2011	2,714	1,750	442	493	29	23%	54%	23%	27%	1%

Source: Larimer County 2017

Figure 4.5 Desired Activities at the Reservoirs



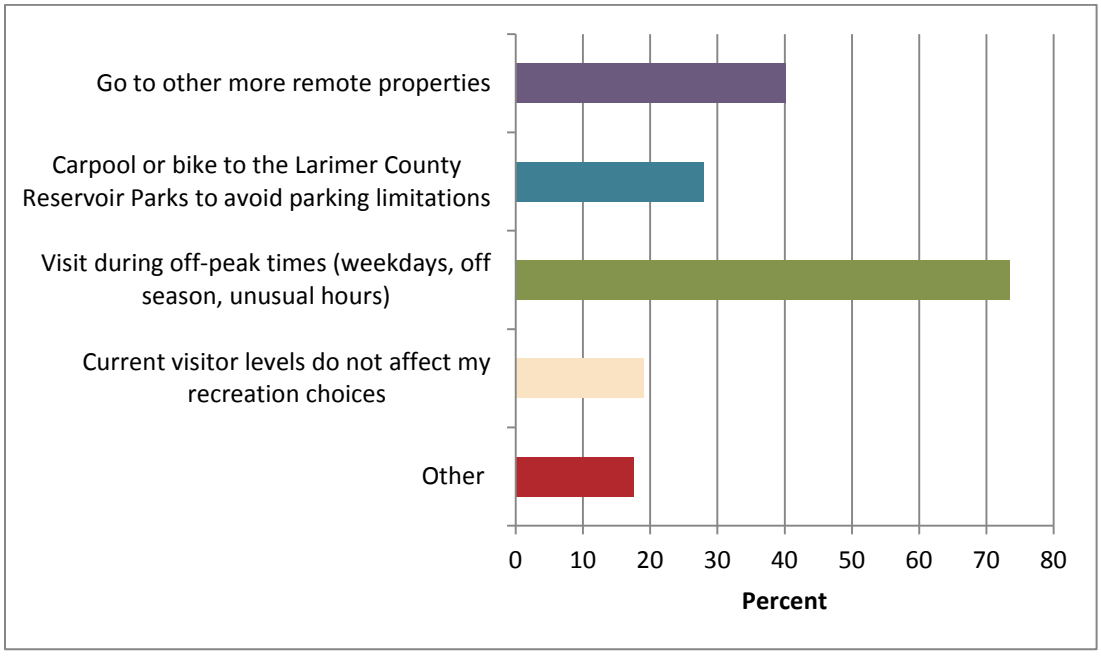
Water-based recreation trends across the state show an increase in paddle sports and adventure sports. This is indicated by an increase in the number of paddleboard and kayak rental operations and sales, both at the reservoirs and at local retailers. In addition, rentals of power boats are on the rise as it becomes more expensive to own a boat and the cost of renting becomes more attractive.

Visitors to Horsetooth Reservoir often visit more than 10 times per year, while visitors to Carter Lake visit 2 to 5 times per year. Participants noted that if they did not visit the reservoirs, it was because of a lack of free time, a concern that there were too many people, or the reservoir didn't offer the activities they are interested in.

Conflict between motorized and non-motorized users of the reservoirs is an apparent theme. Most of this conflict seems to happen while on the water, as opposed to launch areas, and non-motorized watercraft and power boats often occupy the same areas. Frustrations over the turbulence caused by power boats, interference of non-motorized watercraft in motorized areas, and noise/exhaust complaints are among the most frequent responses. Boat ramps are the second-highest area of conflict between these two user groups, mostly due to safety concerns.

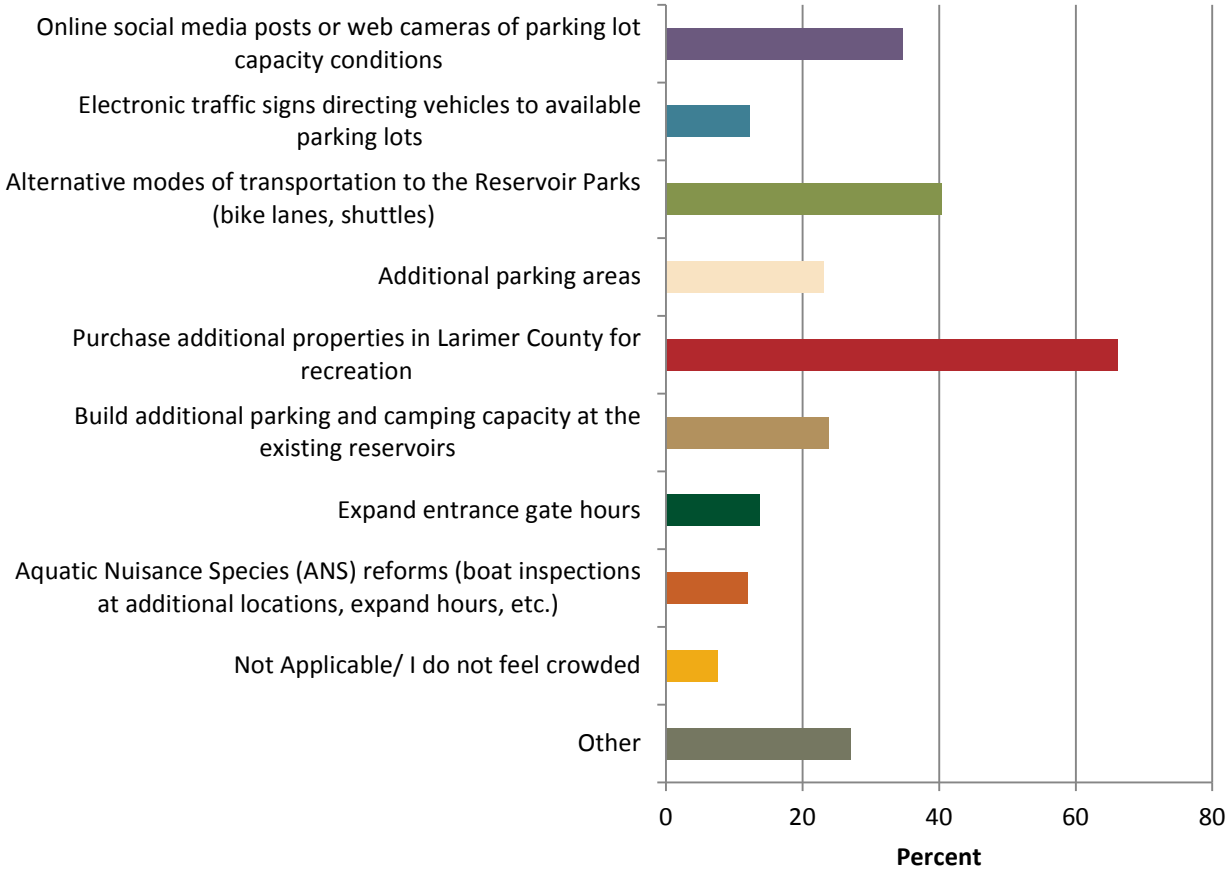
The online questionnaire also included a question on how visitors would respond to crowding at the four reservoirs. The majority (73.5 percent) of respondents said that they would choose to visit the reservoirs during off-peak times, while 40 percent would choose to go to other, more remote properties (Figure 4.6). According to the "other" responses, respondents indicated they use less-crowded locations to access the reservoirs, or live close enough to walk or bike rather than use a vehicle. Some responses had no issues with parking but noted congestion on the trails.

Figure 4.6 How Visitors Respond to Crowding at the Reservoirs



In response to a question on improving the recreational experience, the majority (66.1 percent) of respondents identified the need for acquiring additional properties in Larimer County in order to expand recreational opportunities. Other top responses were alternative modes of transportation to the reservoirs (40.4 percent) and online social media posts or web cameras showing parking lot capacity conditions (34.7 percent). Responses in the "other" category include expanding the soft-surface trail network within recreation areas and providing connections to nearby communities. Other suggestions included considering separating uses on trails; limiting the number of users, including the number of boats on the water; increasing fees; and not building additional camping sites (See Figure 4.7).

Figure 4.7 Strategies to Improve Recreational Experience



Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

Reclamation and Larimer County would continue to manage facilities and public activities in accordance with current practices and current boating capacity limits would be maintained.

Facility shortages, including parking and facility quality would worsen as a result of increasing recreation and visitation demands. Increasing user conflicts would be expected. Without additional resources, such as Larimer County staff, waste and garbage control, trails, campgrounds, and increased maintenance activities the recreation experience at the four reservoirs would be diminished.

Impacts of the Proposed Action (Alternative B)

Overall, implementation of the Proposed Action would have a minor, but positive impact on recreational use and the quality of the experience at the four reservoirs. For the most part, the types of activities, facilities, and experiences provided would remain similar to what is currently available. Current boating capacity limits would be maintained.

At least in the short term, the upgrading of existing recreation sites and construction of new facilities, including additional day use facilities, would increase recreational opportunities available to the public. Additional facilities and new opportunities would help to alleviate the feeling of overcrowding that would likely worsen as a result of increased user populations and demands. Furthermore, the reconfiguration of some high-traffic existing parking areas would improve circulation and reduce traffic related user conflicts.

Because of the increase in the number and types of recreation facilities and opportunities, visitor use and satisfaction would probably increase. However, as visitor use increases, the number of visitors experiencing a feeling of overcrowding may increase, especially among historic users of the four reservoirs. Dispersing user groups to the various recreation sites within the reservoir area, particularly at Carter Lake, would minimize the feeling of overcrowding. The construction of new, designated trails in high-use areas, such as at Rotary (Horsetooth Reservoir) would help to alleviate the creation of social trails in these areas.

Some individuals who desire unconfined and unregulated experience could be displaced to areas where those opportunities are available at other locations. The loss of those users would likely be offset by increases in other visitors attracted by improved opportunities and facilities at the four reservoirs.

Cumulative Impacts

The completion of planned projects, including NISP, the Windy Gap Firming Project, and minor excess capacity contracts, would increase the amount of water-based recreational opportunities in the region. The availability of these additional opportunities, combined with improvements resulting from implementation of the Proposed Action, could reduce crowding and provide a beneficial effect on recreational use and experience at the four reservoirs.

4.3.2 Visual

Affected Environment

The setting of each of the four reservoirs is described separately in the remainder of this section. None of the four reservoirs are located on public lands that have a formal visual resource management system in place. Therefore, existing conditions are described in general terms.

Horsetooth Reservoir and shoreline areas are characterized by a sense of enclosure created by the reservoir's location between two parallel ridges. A series of coves on the west side of the reservoir add to this sense of enclosure, providing a setting where the main body of the reservoir and other popular use areas are not fully visible or audible.

As with most reservoirs, the setting is most attractive at higher water levels when the shoreline appears almost natural and the vegetation and water meet without the adverse visual influence of a broad, barren drawdown zone. Nevertheless, Horsetooth is attractive at most water levels thanks to the visual interplay between the water and the red and brown hogback outcrops at nearly every point on the reservoir.

The influence of human activity is evident at many areas at Horsetooth, particularly around Inlet Bay, South Bay, and Satanka Cove where facilities and residential development combine to create a more developed setting. Most areas, however, have a natural or semi-natural appearance, especially in the coves on the west side. Elevated viewpoints on the surrounding lands, such as Centennial Drive and Foothills Trail on the east shoreline, provide exceptional views of the foothills, including Horsetooth Rock and Lory State Park's Arthur's Rock. Trail systems provide viewpoints with unobstructed views to the eastern plains and City of Fort Collins.

Carter Lake is also located between two prominent landforms: a forested, smooth ridge to the west and a complex of hogbacks and irregular ridges to the east. The western ridge encloses the reservoir and adds visual interest - the heavily forested vegetation contrasts with the more sparsely vegetated adjacent shrub and grasslands. The east side of the lake is dominated by colorful, irregular hogbacks and rock outcroppings, including the Carter Lake Anticline. The Anticline is visible from all points on the reservoir and is characterized by a steeply dipping sedimentary rock dome.

Overall, the Carter Lake landscape retains a semi-natural appearance, particularly on the west side of the lake. In areas where residential development has occurred adjacent to the reservoir boundary (primarily the northeast end) and at sites on the east side disturbed by quarrying activities, the semi-natural landscape has been modified. Visual quality is also impaired at some of the use areas, such as the South Shore and Carter Lake Marina, where a lack of vegetative screening and recreation facilities and other modifications dominate the landscape. Portions of Eagle Campground abut residential development with little buffering.

Pinewood Lake is located in a foothills setting distinct from the other reservoirs. The surrounding landscape combines the openness of the grasslands in the adjacent Rattlesnake Park with a more enclosed mountainous landscape characteristic of the foothills. Views to the south are dominated by Blue Mountain, a natural feature recognized in the Colorado Natural Areas Program (CNAP). CNAP is a statewide program focused on the recognition and protection of

areas that contain at least one unique or high quality natural feature of statewide significance. The CNAP designation is based on the exposure of the Blue Mountain Fault, where the zone of mingling between the alluvial fan of the ancestral Rockies and the ancestral sea are clearly visible (CNAP 2016). Overall, Pinewood Reservoir retains a natural appearance. From some points along the shoreline, no human made structures or facilities are visible; recreational development and facilities are limited to the north side of the reservoir. Use areas near County Road (CR) 18E are influenced by adjacent residential development and passing vehicles.

Flatiron Reservoir is located in a scenic, natural setting on the flanks of Flatiron Mountain, a prominent landmark that dominates the setting. Steep slopes and colorful rock outcroppings on the mountain form a visually interesting backdrop to the reservoir. The landscape surrounding the reservoir has retained a semi-natural appearance. Reclamation facilities, such as the powerplant, are recessed and not prominent in views from the major use areas. The use areas have an urban park character resulting from the non-native tree species and lawn-like areas that contrast with the surrounding native vegetation.

No formal policies have been adopted by Larimer County to protect or enhance visual quality within the reservoirs, apart from the 2007 RMP (see Environmental Commitments in Chapter 5) and Parks Master Plan. Reclamation's Visual Identity Online Manual and other manuals and guidelines for signs and recreation facility design require an evaluation of appropriate architectural styles and materials on a case-by-case basis to complement the surrounding landscape as much as practical. The majority of facilities such as toilets, fee stations, and kiosks, are consistently themed. Development on private land adjacent to the four reservoirs must conform with the Larimer County Comprehensive Plan and Land Use Code.

Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

Under the No Action Alternative, no additional recreation facilities would be developed. Therefore, no direct effects to the existing setting would occur.

Impacts of the Proposed Action (Alternative B)

Visual quality would be modified by implementation of the Proposed Action. However, the degree of change would be reduced by the fact that most new facilities would be located in existing use areas where facilities of a similar scale and density already exist. Visual impacts at each reservoir are further discussed in the remainder of this section.

Visual changes at Horsetooth Reservoir would be most notable at the north end of the reservoir. Development of a small parking area, group shelter, restroom and archery facilities would be visible from adjacent county roads and a few residences. The footprint for the majority of these facilities would occupy a reclaimed motocross course that still bears scars of its former use. The small scale of proposed new development, prior disturbance, screening from the reservoir, and presence of other facilities, such as the Charles Hansen Supply Canal, reduce the degree of change visible in the landscape at this location. Similarly, the expanded boat trailer parking area near Satanka Cove is located in a highly modified setting just below a dam and other Reclamation facilities. The boat trailer parking area is further screened by a hogback ridge that

reduces visibility from nearby residential areas and county roads. Other facility improvements, including a new boat storage building at Inlet Bay, are located in areas that are already characterized by recreation facilities and related development. Overall, new and improved facilities would result in a minor, long-term, adverse impact at Horsetooth Reservoir.

Visual changes at Carter Lake would vary by site. Some visual changes would be negligible, including those areas where proposed facilities are renovations of existing facilities or new parking would be located on previously developed or disturbed lands. The most notable changes are expected to occur at Carter Knolls and the new group campground at Big Landia.

At the Carter Knolls Campground, the addition of 6 cabins would result in the addition of larger, permanent structures that would be visible near the ridgeline as viewed from the reservoir. This development would diminish the natural qualities of the landscape at this location. The development of 6 RV pull-through camp sites would further contribute to this loss seasonally.

The Big Landia group use area, though not visible from the reservoir, would be located in a currently undeveloped area that is visible for 0.5 miles along CR 31. This development would also diminish the natural landscape character at this location.

Development of new day use facilities, including a series of natural swim areas in the vicinity of the Big Thompson Campground, is not expected to result in adverse visual effects due to the fact that new development would largely occur within the footprint of existing use areas and would not require construction disturbance at swim areas. Overall, new and improved facilities would result in a minor, long-term, adverse impact at Carter Lake.

Visual changes and impacts to scenic quality at Pinewood and Flatiron reservoirs would be negligible due to their small scale and improvements within existing developed areas.

Cumulative Impacts

Implementation of the Proposed Action would result in minor, long-term cumulative effects on the natural setting surrounding the four reservoirs, primarily at Horsetooth Reservoir and Carter Lake. These adverse effects would result from the interaction of planned improvements at the four reservoirs and on-going land use changes on private lands adjacent to the four reservoirs. Although no large-scale developments are anticipated, isolated residential development is likely to continue.

4.3.3 Land Use

Affected Environment

The four reservoirs and lands surrounding the reservoirs are owned by Reclamation but are managed by Larimer County under a cooperative agreement to provide public recreational opportunities. (See Chapter 1 for more detail.) The dams, inlet and outlet structures, canals, and other auxiliary structures are managed by Reclamation and Northern Water; public access to these areas is restricted pursuant to the Homeland Security Act of 2002 and other pertinent rules and regulations. Lands adjacent to the reservoirs are comprised of a variety of ownership and use

types. Various utilities cross federal property within granted easements. No agricultural or grazing leases currently exist at any of the four reservoirs.

The four reservoirs are comprised of approximately 6,611 acres. Water surface area and surrounding land area is shown in Table 4.14. The majority of lands within the federal ownership boundaries are largely undeveloped. Developed areas include a variety of recreation use areas, including day-use, camping, and other recreation sites, and infrastructure associated with the dams and auxiliary structures. The undeveloped lands at the four reservoirs are used primarily for dispersed recreation and wildlife habitat. Only a limited amount of undeveloped, usable area remains at the four reservoirs. Table 4.14 summarizes existing land use.

Table 4.14 Summary of Existing Land, Water, and Developed Acreage at Each Reservoir (acres)

	Total area (land + water)	Land Area	Water Surface Area (normal water elev.)
Horsetooth Reservoir	3,765	1,725	2,040
Carter Lake	2,218	1,104	1,114
Pinewood Reservoir	238	141	97
Flatiron Reservoir	390	346	44
Total	6,611	3,316	3,295

Source: Reclamation Standard Operating Procedures, 2003-2005

Adjacent land uses at Horsetooth Reservoir are varied and complex. The reservoir is located among several open space properties, a state park, and urbanizing lands within and adjacent to the City of Fort Collins. Much of the western boundary borders Horsetooth Mountain Open Space and Lory State Park. There is a permit agreement between Lory State Park and Larimer County to allow trail users to pass from Horsetooth Reservoir to Lory, and vice versa, with the pass of the area they originated in via hiking/biking trails or boat access. Much of the eastern boundary of Horsetooth Reservoir borders City of Fort Collins Natural Areas and state-owned land.

Residential development has occurred adjacent to the reservoir at several locations, including Satanka Cove, Inlet Bay, South Bay, and Dixon Cove. Residential development has occurred at these locations because of the proximity to Fort Collins and the overall attractiveness of the setting. The density of residential development, however, is limited by steep slopes and other environmental factors. Nevertheless, demand for view lots and homes in this setting has remained strong and limited development continues to occur.

Colorado State University (CSU) owns a large block of land east of the reservoir. CSU owned-lands include research facilities and the site of Hughes Stadium. The City of Fort Collins maintains several natural areas that border the reservoir, including Maxwell, Pineridge, and Reservoir Ridge natural areas. The City also operates a water treatment facility below Soldier

Canyon Dam. There is very little commercial use of the properties adjacent to the reservoir, with the exception of several locally-owned businesses.

At Carter Lake, residential development has occurred adjacent to the reservoir, particularly along CR 31 at the north entrance, south of CR 8E, and in a large residential subdivision on the east side above the quarry. The majority of land adjacent to Carter Lake, however, remains largely undeveloped.

Other land uses in the vicinity of Carter Lake include limited commercial uses at the north entrance and water treatment facilities below Dam 1. Northern Water owns land on the west side of the ridge from Carter Lake, where the proposed Chimney Hollow Reservoir will be constructed after final environmental permitting is completed. Larimer County will manage recreation use on the reservoir and its adjacent lands. Larimer County also owns 1,847 acres of open space adjacent to the reservoir. A separate management plan for Chimney Hollow will be prepared in the future.

Pinewood Reservoir is the most rural of the four reservoirs and it is located farthest from any city. Directly adjacent to the reservoir is Ramsey-Shockey Open Space. The two properties share a trailhead at the north end of the reservoir. One larger subdivision, Newell's Lake, is located to the east of the reservoir and large lot residential development exists past the reservoir on CR 18E. A section of State Land Board property is located to the west of the reservoir.

Flatiron Reservoir is primarily surrounded by public land to the west and south. Directly east of the reservoir is Larimer County Natural Resources Administrative Building and associated maintenance shop. Large lot residential exists north of the reservoir, across CR 18E.

Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

Under the No Action Alternative, existing land use would remain unchanged. No additional use areas would be developed. Informal use areas and social trails would likely increase in response to growth in visitation associated with population growth in the surrounding region.

Impacts of the Proposed Action (Alternative B)

Approximately 66 acres would be converted from undeveloped to developed uses at the four reservoirs. Most of the new development would occur at Horsetooth Reservoir and most of the remainder at Carter Lake. Acreages of new development at each reservoir are shown in

Table 4.15. The percentage of the total developed area at all four reservoirs would increase slightly but remain less than 10 percent of the total area. Generally, the Proposed Action would have no direct effect on adjacent land uses.

Table 4.15 Comparison of Alternatives: Developed Lands (land acres only)

	Alternative A Total Developed Area (acres)	Alternative B Total Developed Area (acres)	Alternative B Change from Existing Conditions (acres)
Horsetooth Reservoir	159	206	+47
Carter Lake	107	126	+19
Pinewood Lake	23	23.5	+0.5
Flatiron Reservoir	44	0.1	+.1
Totals	**333**	**399.6**	**+66.6**

Source: Logan Simpson 2017

At Horsetooth Reservoir, construction of a new archery area north of Satanka Cove would convert approximately 31 acres from undeveloped to developed use. Only a small portion of the 31 acres would be developed with new facilities, i.e. parking area and buildings. The great majority of the 31 acres would have only limited development, including pathways and target areas. The archery range would only be open during day light hours and use would be managed via a locked gate. An additional 14 acres would be developed north of Satanka Cove for use as boat trailer parking area on an as-needed basis. Overall, new land uses at Horsetooth would constitute a long term but minor impact on land use. The trailer parking lot would be used to accommodate peak use periods and use would be managed via a locked gate.

Construction of new facilities at Carter Lake would result in the conversion of approximately 19 acres of undeveloped area to new uses. Most of this would occur at Big Landia, where approximately 15 acres would be converted to a group campground. Most remaining development would occur within the footprints of existing use areas. Overall, impacts on land use would be minor and long term.

Impacts on land use at Pinewood and Flatiron reservoirs would be negligible.

Cumulative Impacts

No cumulative impacts have been identified for this resource.

4.3.4 Public Facilities and Transportation

Affected Environment

Public facilities and transportation resources consist of facilities and services available to visitors, such as adequate access, potable water, electricity (where applicable), or trash collection. This section first describes the facilities and services that are common to all four reservoirs and then the unique conditions by reservoir.

Table 4.10 summarizes the availability of potable water, flush toilets, dump stations, and staffed entrance/information stations, and other services at each use area.

The four reservoirs are easily accessible from everywhere in the Front Range region and southern Wyoming. Interstate 25, the primary north-south artery through central Colorado, is located approximately 8 miles east of Horsetooth, the furthest east reservoir, and more than 15 miles from Pinewood Reservoir. Several major highways link Interstate 25 to Loveland and Fort Collins, including Colorado Highway 14 and US 34. A network of county roads links the highways to the four reservoirs. The Larimer County Road and Bridge Department maintains the county roads that access the four reservoirs while the Larimer County Department of Natural Resources maintains the roads internal to the each of the four reservoirs.

Developed parking areas support visitation to each reservoir and are one of the tools used to manage carrying capacity. The number of parking spaces is shown in Table 4.10. However, at Carter Lake visitors are allowed to park at some locations below the high water line during lower water conditions, which increases the amount of parking available at that reservoir.

Larimer County provides on-site rangers and is responsible for public safety and law enforcement at all four reservoirs. Larimer County Emergency Services responds to backcountry and more serious emergencies and the Larimer County Sheriff's Department provides law enforcement support when needed. In 2016, Larimer County began to partner with University of Colorado Hospital Authority (also known as UCHealth) and Poudre Fire Authority to staff a ranger boat, which has medical personnel on board during summer weekends and holidays at Horsetooth Reservoir. Trash is collected from dumpsters and trash receptacles by Larimer County staff on a weekly basis. Trash receptacles are available at all major facilities.

Larimer County, in association with Reclamation, manages concessionaire agreements with local businesses at Horsetooth Reservoir and Carter Lake. Two concessionaires operate at Horsetooth Reservoir, including a full service marina with moorings, slips, guides, snack foods, fuel, boat rental and recreational equipment at Inlet Bay. An additional concessionaire is located at Satanka Bay and provides paddle sport equipment, including stand-up paddleboards and kayaks. Other services are available from businesses located on private lands, including a restaurant and general store. At Carter Lake, there is currently one concession operation. The Carter Lake Marina provides moorings, slips, fuel, boat rentals, and recreational equipment rentals.

No concessions currently operate at Pinewood or Flatiron reservoirs.

Horsetooth Reservoir

Four paved county roads provide direct access to Horsetooth Reservoir. CR 42C, CR 23, and 38E approach the reservoir from the east (Fort Collins). County Road 42C is located at the approximate north-south midpoint of the shoreline. CR 23 approaches the reservoir from Bellvue (north) and extends along the entire length of the reservoir, intersecting CR 38E at Spring Canyon Dam. CR 38E continues around the south end of the reservoir and allows access from the west via Masonville. Shoreline Drive provides access between the Spring Creek inlet and Dixon Cove. The western shoreline between Satanka Cove and Dixon Cove is the only portion of the reservoir shoreline that is not adjacent to an improved road.

Horsetooth Reservoir does not have a single main entrance; instead there are multiple access points around the perimeter that provide access to various use areas. Staffed entry/fee collection stations are located at the South Bay and Inlet Bay entrances. During off-peak times, these

stations are self-service. The remaining use areas, including multiple sites located along the east side of the reservoir, have self-service fee collection stations that are regularly patrolled by staff.

Electrical power at Horsetooth Reservoir is provided by Poudre Valley Rural Electric Association and is currently available at the North Inlet Bay, South Inlet Bay, and South Bay campgrounds. Approximately 130 campsites currently have electrical hook-ups. Potable water is available at all locations except the day-use areas, Satanka Cove, and the Sail and Saddle Club property. Flush toilets for public use are located only at the Horsetooth Information Center and at Inlet Bay shower house. Sanitary facilities at other locations are vault toilets. Sewer lines currently cross at South Bay and Inlet Bay. There are three sanitary dump stations at the reservoir; two of these stations are used to dispose of RV holding tank waste, the third is used to dispose of boat holding tanks.

Carter Lake

Carter Lake has two staffed entrance stations; one station is located on the eastern approach on CR 8E and the second station is located north of the reservoir adjacent to the Larimer County Natural Resource Administrative Building (Admin Building) on CR 31. Information and annual passes can be obtained at the Admin Building during normal business hours, Monday through Friday. During off-peak times, these stations are self-service. The remaining use areas have self-service fee collection and information stations and are regularly patrolled by staff.

Vehicular ingress and egress into the Carter Lake Marina, swim beach, and The Saddle and Fawn Hollow Trailhead has several challenges, including a lack of visibility, small turning radii, poor line of sight, and high volume of traffic.

Electrical power is currently available at the north and south ends of the lake. Approximately 74 campsites currently have electrical hook-ups. Potable water is available at the Carter Lake Marina, the Eagle Campground, South Shore Campground, Big Thompson Campground, North Pines Campground, and at the two main entrance stations. The Eagle day use area is the only day use area that offers potable water. Flush toilets are only available at the Eagle Campground. The remaining sanitary facilities are vault toilets. There is one sanitary dump station at the east entrance station; this station is used only for waste disposal of RV holding tanks. There is a boat dump station for boat holding tanks at the marina (North Pines Boat Ramp).

Pinewood Reservoir

Pinewood Reservoir does not have a single main entrance point on CR 18E. Instead, each use area around the reservoir has a separate access point from the county road. There are no staffed entrance stations at Pinewood. Instead, fee collection and information stations are provided at the Admin Building.

The development of the land-based recreation facilities and use areas at the reservoir is limited by topography and steep, rocky slopes at many locations adjacent to CR 18E. Recreation facilities have been constructed on the few flat, developable areas and the remaining shorelines have remained generally in a natural condition.

With the exception of the campground host RV site at the Windy Pines Campground, none of the campsites have electrical hook- ups. Potable water is available at two sites: the Blue Mountain

area and the launch area. Sanitary facilities consist only of vault toilets that are not connected to a central sewage treatment facility. There are no sanitary dump stations; the closest facility is on the east side of Carter Lake.

Flatiron Reservoir

Flatiron Reservoir has one major entry point located off of CR 18E. There are no staffed entrance stations. Instead, self-service fee collection and information stations are available at the nearby Admin Building. Within the site, two main loop roads provide access to the major use areas, including the group picnic and day use areas and the main campground. Informal access to the shoreline via the campground has resulted in social trails leading to the water. Roads are graded, gravel surfaces.

Electrical power is currently available at the Flatiron Campground. Thirty-four (34) individual campsites have electricity. Potable water is available at two locations within the Flatiron Campground. No other potable water sources are available on site; however, the Admin Building has potable water. Flush toilets are available at the Admin Building during business hours; however, only vault toilets are available at the campground. There are no sanitary dump stations at the reservoir. The nearest dump station is at the east entrance to Carter Lake (Gate 1).

Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

The No Action Alternative would have no major impacts on public services available at the four reservoirs. Visitation is expected to increase, however, commensurate with population growth and increasing recreational demands. Increased visitation would likely result in additional law enforcement demands. Traffic congestion and crowding at some use areas would likely increase.

Impacts of the Proposed Action (Alternative B)

The Proposed Action would have minor impacts on some public services and utilities and no impact on others. Upgraded sanitation facilities would be self-contained systems that would not impact existing systems or providers. None of the proposed electrical hook-up improvements would require substantial amounts of electricity. Increased visitation would likely result in an increased need for additional law enforcement personnel. This would impact the Larimer County staffing levels, including the Department of Natural Resources and potentially the Sheriff's Department. Law enforcement needs on adjacent roads and lands could also increase with increased visitation; however, this impact is expected to be minor.

Improvements in the design of the access points to the major recreation areas would reduce the probability of traffic accidents.

The scale of development contemplated under the Proposed Action would minimally increase visitation and the volume of traffic on interior and exterior roads above what would be anticipated under the No Action Alternative. The existing infrastructure is adequate to address the increases in use.

Cumulative Impacts

Visitor use increases are expected under both alternatives as a result of the growing human population of the surrounding area and residential development is increasing in proximity to the four reservoirs. Additionally, seasonal occupancy in the foothills surrounding the four reservoirs is changing to more of a year-round occupancy, generating more local traffic on area roads. Increases in visitation and visitor traffic, combined with an increase in permanent residences in the area, would increase traffic and congestion on the surrounding roads. The increase in recreational traffic is minimal in comparison to year-round residential traffic. Traffic problems would probably continue to increase during the recreation season (June to September), with the heaviest concentrations occurring on weekends and holidays.

4.4 Socioeconomics

4.4.1 Socioeconomics

Affected Environment

This section addresses socioeconomic trends and the economic impact of the four reservoirs on the greater region.

Economic Impact

Outdoor recreation is incorporated into the day to day lives of Colorado residents and it is a key driver of tourism. Larimer County is repeatedly touted for its high quality of life due, in part, to the abundant outdoor recreation opportunities it offers. In 2010, the top three primary reasons for choosing the Fort Collins area to visit were being on vacation, visiting family and friends, and outdoor recreation. Approximately one-in-four non-resident visitors come to the area primarily for outdoor recreation according to one survey (Loomis 2010).

The 2014 SCORP determined that outdoor recreation contributes over $34.5 billion in annual economic activity and creates 313,000 jobs. Outdoor recreation in the North Central region, which includes Larimer and surrounding counties, annually generates just over $8 billion dollars in economic output. In 2015, overnight visitors in Larimer County spent over $600 million; which has steadily risen by 4 percent over the past 5 years (Runyan Associates 2016).

In the 2007 Parks Master Plan, it was determined that 60 percent of reservoir visitors come from outside of Larimer County. By drawing non-local visitation to the area, the four reservoirs generate economic benefits locally and for the greater region in the form of direct and indirect spending by visitors.

Population

Approximately nine Front Range counties comprise the “region of influence” for the four reservoirs: Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld. Population in the region of influence has been steadily growing in each county; growth rates for the past 30 years vary between a low of 22 percent in the City and County of Denver to a high of 1,035 percent in Douglas County.

Colorado Department of Local Affairs projections indicate that population throughout Colorado will continue to grow at a substantial rate (DOLA. 2016a). In Larimer County alone, the population is predicted to grow by 150,000 by 2040; the equivalent of adding another Fort Collins. Between 2010 and 2020, the area of influence is anticipated to add 715,817 people, the majority of which will occur in Arapahoe, Denver and Weld Counties. As Table 4.16 shows, population growth in the area of influence is expected to continue.

A majority of the people living within the region of influence reside in urbanized areas. U.S. Census Bureau statistics show that the populations of the cities of Fort Collins and Loveland grew 11.7 percent and 12.5 percent, respectively from 2010 to 2015 (Census 2016a). Furthermore, four of the top 100 fastest growing cities in the nation for the period 2000-2014, with populations greater than 50,000 persons, are located in the area of influence, including Castle Rock, Douglas County (ranked 13th, 175.6 percent increase), Commerce City, Adams County (ranked 21th, +146.6 percent), Broomfield, Broomfield County (ranked 84th, +62.4 percent), and Thornton, Adams/Weld Counties (ranked 96th, +58.2 percent) (DOLA 2016b).

Table 4.16 Historical and Forecast Population

	Adams	Arapahoe	Boulder	Broomfield	Denver	Douglas	Jefferson	Larimer	Weld	Colorado [a]	USA (millions)
1950	40,234	52,125	48,296	n/a	415,786	3,507	55,687	43,554	67,504	1,325,089	150.7
1960	120,296	113,426	74,254	n/a	493,887	4,816	127,520	53,343	72,344	1,753,947	179.3
1970	185,789	162,142	131,889	n/a	514,678	8,407	235,368	89,900	89,297	2,207,259	203.2
1980	245,944	293,292	189,625	n/a	492,694	25,153	371,753	149,184	123,436	2,889,964	226.5
1990	265,038	391,511	225,339	n/a	467,610	60,391	438,430	186,136	131,821	3,294,394	248.7
2000	363,857	487,967	291,288	n/a	554,636	175,766	527,056	251,494	180,936	4,301,261	281.4
2010 [b]	441,603	572,003	294,567	55,889	600,158	285,465	534,543	299,630	252,825	5,029,196	308.9 [c]
2020 [b]	545,237	687,520	337,897	72,388	734,079	352,955	595,849	360,434	340,265	5,935,920	334.5 [c]
2030 [b]	665,364	810,672	379,714	92,051	804,797	425,395	652,326	424,882	466,717	6,970,651	359.4 [c]
2040 [b]	787,411	935,138	416,942	95,453	867,545	482,079	686,319	483,322	605,605	7,925,230	380.2 [c]
2050 [b]	893,563	1,016,184	436,166	95,658	922,512	494,181	700,173	542,039	738,396	8,686,850	398.3 [c]

Source: Census 2016a. Compiled by the Demography Section from U.S. Census Bureau Records
[a] *Source: DOLA 2016b*
[b] *Source: DOLA 2016a*
[c] *Source: Census 2016b*

Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

The No Action Alternative would have a minor direct effect on the local and regional economies. An increase in visitation commensurate with population growth and increasing recreational demands would likely benefit local businesses and Larimer County revenues.

Impacts of the Proposed Action (Alternative B)

Implementation of the Proposed Action would result in both short term and long term socioeconomic impacts. Short term impacts would be associated with the construction phase of the project, including expenditures for workers, materials and services. Construction activities would likely be phased over a several year period and employment and expenditures would be minor relative to the scale of the local and regional economies. Therefore, short term effects would be negligible.

Long term effects would be associated with increased visitation and associated increases in expenditures for gas, lodging and services. As previously discussed, growth in visitation is anticipated even without completion of any of the facility enhancements and expansions that are included in the Proposed Action. Given the small scale of proposed facility expansions, only a minor increase in visitation can be attributed to the Proposed Action (See Table 3.3 in Chapter 3 – Comparison of Planned Campsites and Parking Spaces). For this reason, long term effects on socioeconomics are anticipated to be minor.

Cumulative Impacts

On-going population growth in the project region, as well as specific planned projects such as NISP and Chimney Hollow, would result in impacts to socioeconomics in the region. If construction of new and expanded facilities occurs concurrently with that of planned new reservoirs, some cumulative effects would occur. However, the increment of new economic activity and employment associated with implementation of the Proposed Action would be minor and any resulting short term effects on socioeconomics would be negligible.

4.5 Cultural Resources

4.5.1 Cultural Resources

Affected Environment

The four reservoirs and facilities associated with the C-BT Project are an important aspect of local and regional history. These facilities lie within a designated historic district, the Colorado Big Thompson Historic District, which was determined to be eligible for listing on the National Register of Historic Places (NRHP) in 1998. Most of the project facilities at the four reservoirs: e.g. the dams, canals and other structures are considered to be contributing resources to the district. These contributing features are numerous and are not individually listed in the discussions that follow for each reservoir. In addition, a number of other cultural sites have been documented on project lands at all four reservoirs. These resources are summarized in the remainder of this section.

Historic sites at Horsetooth Reservoir are predominantly associated with stone quarrying activities. Limited quarrying occurred at the reservoir in the 1870’s, but large-scale development began in the early 1880’s with the arrival of the railroad. Stone quarried at the reservoir site was shipped as far as Kansas City and other Midwest cities. Stone from the reservoir site was also used in many prominent buildings in several Front Range communities, including Denver, Boulder and Fort Collins. Commercial quarrying operations sharply declined in 1893 and

completely ceased by 1920. Many of the historic quarry sites are located on the west side of the reservoir and the sites retain relatively little evidence of past activities. Remnants of stone retaining walls are evident above the high water line north of the swim beach.

Settlement at Horsetooth Reservoir included agricultural homesteads and a community supporting the quarry operations. The original town of Stout, now inundated, included homes, schools, shops, a post office, three saloons and a brothel. No residences or other major structures remain from the early settlement period; however, stone enclosures and wall remnants have been found at numerous locations throughout the reservoir site. These remnant enclosures and walls were primarily used to confine livestock. Most of the historic sites at Horsetooth Reservoir are not eligible for NRHP listing; however, three sites at Horsetooth Reservoir are eligible for NRHP listing. The eligible sites include the Walthen Ranch and Second Stout Post Office site, an historic quarry site and an historic trash dump. Two of these sites are located below the high water line.

Prehistoric sites have also been identified at Horsetooth, including lithic scatters, hearths, and other indications of campsites or tool manufacturing. Two of these prehistoric sites are considered potentially eligible for NRHP listing and several other sites require additional investigation before their NRHP status can be determined.

A Class III cultural resources survey was completed for Carter Lake in 2008 (Kester-Tallman/Brant, 2008). A total of 17 sites were documented. Of these sites, five are considered eligible for listing on the NRHP, including four prehistoric sites and one historic site. One of the eligible prehistoric sites is a human burial that may contain additional human artifacts and materials. Two of the other eligible sites are open camps and the third is a quarry site where tools were manufactured.

The eligible historic site at Carter Lake is a newly recorded site containing a foundation, linear alignment of stone slabs and a trash scatter.

Previous cultural resource surveys at Pinewood Reservoir have identified 12 cultural site locations, including eight prehistoric sites. Only one of the prehistoric sites is considered eligible for NRHP listing, which is an open camp site with a hearth and an assemblage of stone tools.

Cultural resources at Flatiron Reservoir include one eligible historic site, which consists of masonry and walls/culverts constructed along an old road to Estes Park that was in use from 1881 to 1933. It may have functioned as a bridge over the intermittent stream.

Environmental Consequences

Impacts of the No Action Alternative (Alternative A)

No direct disturbance of cultural resource sites would result from the No Action Alternative. Existing access control and visitor management practices would continue. However, increased visitation, as a result of population growth and growing recreation demands, would present increased risk of disturbance to cultural sites due to trampling, increased erosion, and higher instances of vandalism.

Impacts of the Proposed Action (Alternative B)

No known cultural resources would be directly impacted. However, potential impacts to unknown or unrecorded cultural resources could occur, and would be associated primarily with physical disturbance during construction of new facilities or the reconfiguration of existing facilities outside of the footprints of existing developed recreation sites. Reclamation would consult with the State Historic Preservation Officer (SHPO) and tribes prior to any ground-disturbing activities to review the adequacy of proposed mitigation measures and to determine if any additional measures are necessary.

In addition, all contracts would include a "stop work" clause if evidence of cultural resources is found during construction. If cultural resources are encountered during construction, avoidance of any further disturbance and protection of the resources discussed would occur whenever possible. If avoidance is not possible, Reclamation would enter into consultations with SHPO regarding the eligibility of the subject sites for inclusion in the NRHP. This information would take the form of cultural resource reports and site forms, and could also include the results of archaeological testing of the subject sites. If avoidance of sites that are determined eligible for inclusion in the NRHP is not possible, Reclamation would take measures to mitigate impacts to those sites. The nature and extent of those mitigation measures will be determined in consultation between the SHPO and Reclamation.

Increased visitation, as a result of population growth, growing recreation demands, and improved recreation opportunities would present increased risk of disturbance to cultural sites due to trampling, increased erosion, and higher instances of vandalism.

Cumulative Impacts

No cumulative effects would occur due to direct disturbance associated with implementation of the Proposed Action. However, increased visitation combined with regional growth could result in additional effects to cultural resources due to an increased risk of vandalism and inadvertent damage from trampling and the creation of social trails.

4.5.2 Paleontological Resources

Affected Environment

Paleontological resources are defined as any fossilized remains, traces, or imprints or organisms preserved in or on the earth’s crust that are of paleontological interests and provide information about the history of life on earth except those associated with an archaeological resource, as defined in ARPA or cultural items, as defined in the Native American Graves Protection and Repatriation Act of 1990. The PRPA mandates that Reclamation manage and protect paleontological resources on federal land using scientific principles and expertise. Potential effects of the described alternatives on paleontological resources are the primary focus of this analysis. The affected environment for paleontological resources corresponds to the Area of Potential Effects (APE) for direct effects for historic properties.

Environmental Consequences

Reclamation contacted the Bureau of Land Management (BLM) to obtain information concerning the Potential Fossil Yield Classification (PFYC) for paleontological resources within the APE. The PFYC is a system used by the BLM to assess the potential for discovery of significant paleontological resources or the impact of surface disturbing activities on these resources.

The geologic formations within the four reservoirs are generally known to contain vertebrate fossils or scientifically significant non-vertebrate fossils, but these occurrences are widely scattered. Horsetooth and Carter reservoirs both contain Morrison Formation deposits on the east side of the reservoirs, which are classified as PFYC of 5. These areas are known to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Most of the other formations within the four reservoirs are classified with a PFYC of 3, which indicates moderate potential for significant fossils. Northern portions of Pinewood Reservoir have granite and metamorphic rock which have a very low (PFYC=1) likelihood of fossils.

Impacts of the No Action Alternative (Alternative A)

Under the No Action Alternative, there would be no foreseeable impacts to paleontological resources.

Impacts of the Proposed Action (Alternative B)

There is a potential for impacts to paleontological resources but impacts to significant paleontological resources is minimal. The potential for the Proposed Action to impact a significant fossil locality is low, but is somewhat higher for common fossils.

Improvements made on the east side of Horsetooth Reservoir and Carter Lake, especially at a new developed site like Big Landia, may have impacts to paleontological resources. A field survey may be necessary prior to surface disturbing activities or land tenure adjustments. Increased visitation, as a result of population growth and growing recreation demands, would present increased risk of disturbance due to trampling, increased erosion, and higher instances of vandalism.

The standard environmental commitments for all four reservoirs includes a stop work clauses in the event resources are discovered during ground-disturbing activities associated with the Proposed Action.

Cumulative Impacts

No cumulative effects would occur due to direct disturbance associated with implementation of the Proposed Action.

4.6 Other Resources

The Proposed Action will have no effect on other resources such as air quality, environmental justice, ITAs, wilderness, wild and scenic rivers, and national landmarks.

ITAs are legal interests in property held by the United States for Indian Tribes or individuals, as well as rights granted under treaties, such as fishing and hunting rights. The Department of the Interior's policy is to recognize and fulfill its legal obligation to identify, protect and conserve the trust resources of federally recognized Indian tribes and tribal members; and to consult with the tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal health and safety (Department of Interior, Departmental Manual 512, Chapter 2). The affected environment for ITAs corresponds to the APE for direct effects for historic properties. Reclamation will contact the Bureau of Indian Affairs, Anadarko, Concho, Fort Peck, Northern Cheyenne, and Wind River Agencies to identify any potential impacts to ITAs within the APE. No ITAs have been identified within the APE in the Draft RMP/EA. Additional findings and impacts, if any, will be presented in the Final RMP/EA.

Executive Order 12898 on Environmental Justice requires federal agencies to analyze programs to assure that they do not disproportionately adversely affect human health and environmental effects on low income and minority populations. No minority populations exist in the general project area and implementation of the Proposed Action would not disproportionally affect low-income or minority populations.

4.7 Unavoidable Adverse Impacts

Unavoidable adverse impacts are assumed to be long-term impacts to resources that would be affected by implementing the RMP. No unavoidable adverse impacts are expected as a result of this federal action.

4.8 Relationship between Short-Term Uses and Long-Term Productivity

For this federal action, short term is defined as the 10-year planning life of the RMP. New projects and other implementation actions identified in the RMP would be accomplished within the 10-year timeframe. Although rehabilitating and revegetating disturbed areas to their natural state may require more than 10 years, the process would begin during the planning life of the RMP/EA and most areas where new disturbance is planned have already been disturbed and would return to a condition as good as or better than current conditions within 10 years. These actions are therefore considered to be short term. Long-term is defined as conditions extending beyond the 10-year planning life of the RMP.

The management actions detailed in this RMP are intended to prevent further degradation of the environment that is occurring under the current conditions or is likely to occur as a result of future visitation. It is assumed that the short- and long-term goals and objectives for managing the area would not change over time and that there would be no loss of productivity of the natural and social environment.

4.9 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments are considered to be the permanent reduction or loss of a resource. Implementation of either of the alternatives would not result in any irreversible

loss of resources. The primary commitment of resources occurred when materials and lands required for construction of the dam, reservoir, and associated conveyance features were made. These resources have already been irreversibly committed for the life of the four reservoirs.

No irretrievable commitments of resources are expected under either of the alternatives. New and enhanced facilities would require a very limited commitment of building materials and their construction would occur in a manner that minimizes any irreversible or irretrievable commitment of resources.

Chapter 5 — RMP Implementation Procedures

Reclamation's Eastern Colorado Area Office (ECAO) has primary responsibility for implementation and monitoring of the RMP. An effective and cooperative relationship between Reclamation and the managing partners is necessary, which includes commitment by all of the entities to seek financial, program, and staffing resources necessary to implement the proposed management actions. Implementation of the RMP by Reclamation and its partners will be guided by existing and future laws, Executive orders, regulations, and Reclamation policies and guidelines. This RMP is designed to supplement existing direction provided by those sources.

Because funding priorities are subject to change, implementation of specific actions will require close coordination between Reclamation and managing partners. Administering and managing partners interested in the management and use of the reservoir lands and waters include Reclamation, Larimer County, Northern Water and CPW. The responsible entity will prepare a work plan to accomplish the identified actions and request an adequate level of funding. Reclamation can enter into cooperative agreements with permittees, users, interested public, and others to accomplish RMP objectives.

Based on public input and internal review of Reclamation programs, the goals, objectives and management actions outlined in Chapter 3 are intended to be implemented within the four reservoir project areas. The overall goal is to implement the actions within the 10-year planning period; however, implementation depends on, among other things, available funding, cooperation of other involved entities; cost-sharing efforts; results of visitor use surveys; and monitoring of individual recreation areas.

Other factors that may influence the implementation of a particular action are based on whether the action: (1) is procedural or technical, such as preparing agreements or developing specific plans; (2) addresses public health and safety concerns; (3) is required to prevent resource damage or protect wildlife species or habitats; or (4) requires large capital investments, such as facility development. Successful planning and coordination will be necessary to identify annual program priorities and will be essential in securing funding necessary to accommodate the goals and objectives of this RMP.

5.1 Monitoring

Periodic monitoring will be conducted by Reclamation on an on-going basis throughout the 10-year life of the RMP to track progress in implementing the RMP, track the effectiveness of management actions, track progress toward a desired condition, and detect unacceptable effects. Monitoring activities may be reduced when goals and objectives have been reached. Ongoing evaluation of the monitoring program will allow Reclamation to make modifications in timing of improvements, timing of mitigation implementation, and changes in the RMP that are needed to take into account changing visitation needs or other changes in site conditions.

Review and monitoring efforts already underway that can assist in RMP implementation include:

- Accessibility Reviews

- Concession Reviews
- Comprehensive, Periodic, and Annual Reviews of Dams
- Facility Condition Assessments
- Financial Reviews
- NEPA Compliance
- Recreation Compliance Reviews
- Recreation Use Data Reports
- Regional and Policy Visits
- Reservoir Management Reviews
- Water Quality Monitoring
- Weed Monitoring
- Wildlife Sighting documentation
- Visitor Surveys (by Larimer County)
- Water Testing (by Fort Collins Utilities)
- Angler Surveys (by CPW)

5.2 Standards and Guides

The Reclamation Recreation Facility Design Guidelines (Reclamation 2002) provides examples of recreation facility design details. Use of these guidelines is intended to meet best management practices, assist in the planning and budget processes, and provide consistent designs throughout Reclamation's system of facilities. Reclamation, its managing partners, and concessionaires are encouraged to use these guidelines in the design and development of new recreation facilities and the renovation of existing facilities. As new designs, technology, and materials are developed, they will be added to the manual guidelines, and existing materials will be reevaluated. The manual provides guidelines for the following facilities (Note: not a comprehensive list):

- Entrance stations
- Camping facilities and campground layout
- Picnicking facilities
- Comfort station buildings
- Boating facilities
- Fishing facilities
- Utilities

Sign guidelines, to improve communication with the public, are provided in the Reclamation Visual Identity Manual (Reclamation 2015). Roadway signs on Reclamation land must also follow the Federal Highway Administration's Manual on Uniform Traffic Control Devices. These guidelines encourage the development of a sign program that fosters safety, facilitates management of an area, provides a learning opportunity for visitors, and offers a positive image and identity for all entities involved in the management of the area.

5.3 Plan Revision or Amendment to the RMP/EA

Reclamation may revise or amend the RMP within the established 10-year planning period as necessary. During the implementation or monitoring phases of the RMP, Reclamation, other agencies, or the public may identify problems, deficiencies, or additional issues that should be addressed. Changes in the social, economic, physical, or environmental conditions may also necessitate changes to the RMP/EA. Minor changes in project descriptions that do not conflict with the established goals and objectives would be documented by Reclamation and Larimer County and would not require further public involvement and NEPA compliance. Changes that would modify one or more of the prescribed decisions and require major changes to the established goals and policies would be documented by an amendment to the RMP and may require further public involvement and NEPA compliance. Reclamation will determine the level of public involvement and NEPA compliance.

The RMP is expected to be re-evaluated at the end of the 10-year planning period (year 2027) to determine whether or not the RMP should be revised.

5.4 Standard Environmental Commitments

The following environmental commitments will be implemented to offset potential effects to the resources within the individual project areas at the four reservoirs.

5.4.1 Recreation Facilities, Trails, and Aesthetic Values

- Erosion control structures, such as waterbars, drain dips, checkdams, culverts, or French drains will be installed, where appropriate, to control water movement and protect soils and vegetation.
- User-created informal trails will be closed, restored, and discouraged.
- Proper regulatory and informational signing will be posted throughout the reservoir areas informing the public of rules and regulations governing the use of at the four reservoirs.
- During facilities or trails location, all efforts will be made to avoid wetlands, riparian areas, rare plant communities, cliffs, and steep and/or rocky slopes.
- In high use areas, designated campsites and signage may be used to limit ecological and social disturbance.
- Temporary recreation closures may be necessary when construction poses a risk to visitor safety or resource damage. Temporary signs and fencing would be installed when appropriate to prevent public access. Construction would be scheduled during periods of low use, to the practical extent.
- As much as possible, onsite material will be used for construction.
- Recreation facility development will complement the surrounding landscape as much as practical and will follow: (1) site specific recreation master plans; (2) design and construction criteria, guidelines, and standards; and (3) development criteria to protect the visual quality of the reservoir area.
- Reclamation and Larimer County will work with law enforcement entities to ensure enforcement of all laws and regulations.

5.4.2 Noxious Weeds and Pest Management

Site and land use specific pest management protocol is discussed in the Integrated Pest Management Plan for the four reservoirs (Sisneros 2000).

- Maintain compliance with state and local noxious weed laws.
- Reduce competition of undesirable plants with native and/or planted vegetation.
- Control vertebrate and invertebrate pests as necessary to protect public health and safety, and to prevent damage to public and private property.
- Clean all heavy equipment before entering and exiting construction sites to minimize transporting weed seed.
- Reseed after construction, heavy maintenance, and other soil disturbing activities.
- Minimize sources of weed seed. Use clean fill material from weed-free sources. If straw is used for stabilization and erosion control, it must be certified weed free or weed seed free.
- Control noxious weeds and prevent their establishment and spread on public and adjacent private lands.
- All known noxious weed populations at new construction sites will be treated or eliminated prior to project implementation to prevent the spread of these populations.

5.4.3 Plants and Wildlife

- Protect known active and inactive raptor nest areas.
- Avoid disturbing threatened, endangered, and proposed species (both flora and fauna) during breeding, young rearing, or at other times critical to survival. Areas will be closed to activities, as needed, during these periods.
- No trees suitable for bald eagle roosting will be removed unless they are dead or below the high water line.
- Maintain a database of important wildlife resources, fill data gaps that are currently unknown (e.g., active raptor nests, additional winter eagle use area).
- Establish a cooperative program (e.g., through CSU or CPW agreements) to inventory and monitor wildlife resources.
- Restore disturbed areas with native plant species to enhance existing wildlife habitat; establish native plants in areas disturbed by new construction.
- Control the invasion and spread of noxious weeds and other undesirable exotic plants that threaten native habitat or biological diversity.
- Where new facilities in undeveloped areas are within PCAs, County natural resource and CNHP specialists will be consulted to prevent impacts to rare species.

5.4.4 Soil and Water

- Where excessive soil impacts exist from prior activity, the emphasis shall be on reclamation and preventing any additional detrimental impact, where feasible.
- Build erosion resistance into project design to reduce costly maintenance and restoration (Clean Water Act Sections 402(p) and 404); mitigate concurrently with construction

(disturbance of more than 5 contiguous acres per project requires a state storm water discharge permit; a 404 permit would be required if more than 0.5 acre of Waters of the U.S. are disturbed).

- Where required by state laws, appropriate permits relating to discharge and sedimentation will be obtained prior to construction.
- Erosion control plans and re-vegetation plans will be developed and implemented in project-specific NEPA compliance.
- When constructing roads and trails, steep slopes and areas already prone to landslides, should be avoided where possible. Specific measures to stabilize landslide potential slopes will need to be identified in the project-specific NEPA compliance.
- Avoid soil-disturbing actions during periods of heavy rain, wet soils, and periods of heavy snowmelt.
- Control adverse water quality effects from human activities below high water levels.
- Allow camping in designated sites only.
- Protect or restore shoreline vegetation as a means of controlling erosion.
- Ensure that operations at marinas follow best management practices for fueling boats and use of fuel containers. Control potential pollutants (gasoline, petroleum products) associated with boat activity.
- Coordinate with the Larimer County Community Development and Health and Environment Departments to minimize contamination from sewer systems and other land uses.
- Design catchment basins and or wetlands to detain runoff from campgrounds and parking lots.
- Reclamation and the Larimer County Manager would implement management practices at boat launches and marinas to control the introduction and spread of these invasive species following guidelines specified by the CPW Aquatic Nuisance Species Program.
- Minimize the area disturbed during construction.
- Control runoff from disturbed areas during construction.
- Revegetate disturbed areas as soon as practically possible after construction.
- Construct trails to have the minimal necessary widths.
- Construct trails to follow topographic contours or to have low slopes.
- Use retaining walls where necessary.
- Minimize native tree removal.

5.4.5 Cultural Resources

- In accordance with the NHPA, all significant cultural resources (historic properties) will be protected or mitigated in consultation with SHPO and tribes.
- Prior to the initiation of any federal undertaking within the concept areas, Management Boundary, all cultural resources sites within the undertaking APE area will be evaluated for their NRHP eligibility.

- If historic properties are located within the individual concept plan areas, and if they would potentially be adversely affected by activities, a Memorandum of Agreement will be developed. The Memorandum of Agreement would include the terms and conditions agreed upon to resolve the adverse effects of the undertaking upon historic properties.
- Should an unknown cultural resource site be discovered during construction or slope stabilization, all ground disturbing activities within 100 feet of the discovery must be suspended immediately. Reclamation's Eastern Colorado Area Office (ECAO) archaeologist will be notified and appropriate measures implemented to preserve the integrity of the site. No further work will be allowed in the area until the discover has been adequately investigated. All contracts would include a "stop work" clause if evidence of cultural resources is found during construction.
- Should vertebrate fossils be encountered prior to or during ground disturbing activities, construction must be suspended immediately. Reclamation's ECAO archaeologist should be contacted and work in the area of discovery shall cease until a qualified paleontologist can be contacted to assess the find. All contracts would include a "stop work" clause if evidence of paleontological resources is found during construction.

5.4.6 Wetlands and Riparian Areas

- If stream crossings or other instream structures are necessary, they will be designed to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life.
- Avoid any loss of rare wetlands such as fens and springs.

5.5 Implementation Schedule

The implementation of the majority of these projects would be phased over the next 10 years. Due to the uncertainty of funding from fiscal year to fiscal year, a precise schedule for each project cannot be developed. To facilitate this, annual coordination is needed between Reclamation and the managing partners to discuss issues, solutions, funding sources, and implementation priorities of the management actions.

Chapter 6 — Consultation and Coordination

In addition to an extensive public involvement program, the following groups, agency representatives, and persons were involved with the development of the RMP/EA. The public involvement activities and the planning process are discussed in Chapters 2.

The SHPO was consulted per Section 106 of NHPA. Consultation with tribal interests is on-going and results of these consultations will be incorporated into the Final RMP/EA.

6.1 Planning Team

6.1.1 Bureau of Reclamation - Eastern Colorado Area Office

- J. Signe Snortland, Area Manager
- Tony Curtis, Resource Division Chief
- Laura Harger, Supervisory Natural Resource Specialist
- Patrick McCusker, Project Manager / Natural Resource Specialist
- Hallie Groff, Natural Resource Specialist
- Terence (Terry) L. Stroh, Environmental Specialist
- Sterling Rech, Public Affairs
- James Bishop, Public Involvement Specialist

6.1.2 Larimer County - Department of Natural Resources

- Gary Buffington, Director
- Ken Brink, Project Manager / Visitor Services Manager
- Mark Caughlan, Horsetooth District Manager
- Dan Rieves, Blue Mountain District Manager
- Meegan Flenniken, Resource Program Manager
- Teddy Parker-Renga, Community Relations Specialist
- Todd Blomstrom, Public Works Director
- Chris Fleming, Open Space Operations Manager
- Steve Gibson, Open Space Operations Manager
- Jennifer Miller, Accountant

6.1.3 Consultant Team - Logan Simpson

- Bruce Meighen, Principal in Charge
- Jeremy Call, Project Manager / Parks Master Plan Technical Lead
- Kristina Kachur, Assistant Project Manager
- Tom Keith, RMP/EA Technical Lead
- Jana McKenzie, Landscape Architect
- Andy Veith, Landscape Designer
- Travis Bugg, Archeologist, Mapping Specialist
- Casey Balthrop, Biologist

- Allison Baxter, Mapping Specialist
- Susan Sieger, Crossroads Consulting Services
- Seth Merrill, Web Developer, Liquid Designs, LLC

6.2 Committees

6.2.1 Larimer County Board of Commissioners

- Lew Gaiter III, District 1
- Steve Johnson, District 2
- Tom Donnelly, District 3

6.2.2 Technical Advisory Committee

- Brian Werner, Northern Water
- Brad Wind, Northern Water
- Jim Struble, Northern Water
- Roy McBride, CPW
- Ty Petersburg, CPW
- Larry Rogstad, CPW
- Daniel Sprys, CPW
- Chad Morgan, CPW
- Brian Little, Western Area Power Association
- Mark Sears, Fort Collins Natural Areas Department
- Todd Juergens, Larimer County Road and Bridge
- Matt Lafferty, Larimer County Planning Department
- John Manago, Larimer County Sheriff's Department

6.2.3 Stakeholder Committee - Larimer County Parks Advisory Board

- Chris Klaas
- Mark DeGregorio
- Stephanie Van Dyken
- Nick Clark
- Deborah Shulman
- Steve Ambrose
- Frank Gillespie
- Rob Harris
- John Gaffney
- Ron Kainer
- John Tipton
- Russell Fruits

6.3 Stakeholder Groups Contacted for Participation

- U.S. Army Corps of Engineers

- Carter Lake Marina
- Carter Lake Marina Customers
- Carter Lake Sail Club and Members
- Centennial Bass
- Colorado Mountain Club
- Colorado Natural Heritage Program
- Colorado State University Crew Team
- Colorado Walleye Association
- FoCo Trails Advisory Group
- Fort Collins Mountain Bike Association
- Fort Collins Rowing Association, Inc.
- Horsetooth Sail and Saddle Club / Horsetooth Recreation Corp.
- Inlet Bay and Field of Dreams homeowner/neighborhood association
- Inlet Bay Marina
- Larimer County Commissioners
- Larimer County Horseman's Association
- Larimer County Open Lands Board
- Larimer County Planning Commission
- Loveland Open Lands Committee
- Mountain SUP
- Northern Colorado Climbing Coalition
- Overland Mountain Bike Club
- Quarter Horse Association
- Reservoir neighbors
- Stillwater Fishing Advocates
- Team BOB (Babes on Bikes)
- U.S. Forest Service

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Appendix B — Glossary

Acre-foot—A measure of quantity consisting of one acre of water one foot deep; equals 43,560 cubic feet or 325,851 gallons.

Administrative Actions—The day-to-day actions necessary to serve the public and to provide for the management and use of the land and resources.

Authorized Activity or Use—An activity or use of the reservoir area allowed or permitted pursuant to valid existing rights or pursuant to a right-of-use document issued by Reclamation or another agency within its jurisdiction.

Best Management Practices (BMPs)—Programs, practices, policies and procedures, and structures or activities which have been shown to be effective in management and protection of a given resource. This term is most often used in regard to water quality and soil protection.

Carrying Capacity—Estimated amount of use or population that a given area can support without inducing unacceptable levels of damage to the area or its associated resources.

Concession—A non-Federal commercial business that supports public recreational uses and provides facilities, goods, or services for which revenues are collected. A concession generally involves use of the Federal estate and may involve the use or development of improvements.

Critical Habitat—An area occupied by a threatened or endangered species "on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management consideration or protection" (16 USC 1532 [5] [A] [I] 1988).

Cultural Resources—Those remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human events. These consist of (1) physical remains, (2) areas where significant human events occurred, even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resources.

Directives and Standards—A component of the Bureau of Reclamation Manual which provides the basic instructions and requirements for an action or process.

Diversity—Relative degree of abundance of wildlife species, plant species, ecological communities, habitats, or habit features per unit of area.

Easement—An interest in land that gives the owner of the easement the right to use another person's real property for a specific purpose.

Endangered Species—Species that are in danger of extinction in all or a significant portion of their range. The Secretary of Interior makes the determination for federal listing.

Enhancement—The act of increasing or making greater, as in value or quality.

Erosion—The wearing away of the land surface by running water, wind, ice or other geologic agents, or resulting from human or animal activities.

Fire Management Plan—A site-specific plan for managing fire on a property. The plan should include risk assessment, suppression guidelines, partnerships, control measures, controlled burn guidelines, fuel management, and other fire management actions.

Heritage Resources—Property, plant, and equipment of historical, natural, educational, artistic, or architectural significance.

Historic Property—Cultural resources which are eligible to the National Register of Historic Property.

Integrated Management or Planning—The planning and implementation of a coordinated program utilizing a variety of methods for managing an area or resource to meet the objectives for that area or resource.

Integrated Pest Management—A coordinated program utilizing a broad range of methods to manage undesired animals and pests within an area. Methods may include education, preventive measures, good stewardship, and biological, cultural, chemical, and mechanical control.

Interagency Agreement—An agreement between two agencies which outlines the roles and responsibilities of the agencies in a collaborative action.

Managerial Conditions—Managerial conditions are the features or characteristics of a recreation setting that may define and distinguish the recreation experience. Management attributes may include facilities (e.g., ranging from water markers to full service marinas and campgrounds), rules, regulations, water operations, educational programs, fees and charges, interpretation, signage, law enforcement, design, lighting, concessions, and special use permittees.

Managing Entity or Partner—(1) A person, company, or agency which manages Reclamation lands and/or projects pursuant to a contract or agreement with Reclamation.

Mineral Resources—Common varieties of minerals such as sand, gravel, soil; also, sometimes referred to as “saleable minerals.”

Mitigation—(1) Avoiding or reducing possible adverse impacts to a resource by limiting the timing, location, or magnitude of an action and its implementation; (2) rectifying possible adverse impact by repairing, rehabilitating or restoring the affected environment or resource; (3) reducing or eliminating adverse impacts by preservation and maintenance operations during the life of an action.

Mitigation Measure—A measure or action taken to reduce the adverse impacts to the environment from implementation of a project or another action. Such measures may include avoidance, replacement, restoration, relocation, timing of operations, etc.

Noxious Weed—An alien plant that is invasive and undesirable and declared a noxious weed by the State or County and which generally meets one or more of the following criteria: (a)

aggressively invades or is physically damaging to economic crops or native plant communities; (b) is detrimental to the environmentally sound management of natural or agricultural ecosystems; (c) is poisonous to livestock; (d) is a carrier of detrimental insects, diseases, or parasites.

Personal Watercraft (PWC)—A vessel which uses an inboard motor powering a water pump as its primary source of power; it is designed to be operated by a person sitting, standing, or kneeling on the vessel, rather than sitting or standing inside the vessel; some PWCs can carry as many as three seated people.

Physical attributes (setting)—Physical attributes are features or characteristics of a recreation setting that may help to define and distinguish the recreation experience. Physical attributes can be divided into natural features or built structures of a more permanent or fixed nature.

Plan Amendment—A plan modification based on changes in circumstances or conditions affecting the scope, terms, or conditions of this plan, particularly for a proposed action which does not conform to this plan, but which warrants further consideration prior to a scheduled revision. Generally an amendment only involves one or two issues.

Plan Maintenance—Activities taken to maintain and update this plan without changing its scope or intent or affecting the basic decisions, terms and conditions, use levels, or restrictions contained therein. Such activities may include posting new information, refining analyses, and making minor changes in management actions.

Plan Modification—Activities taken to maintain and update this plan which would change its scope or intent; or affect the basic decisions, terms and conditions, use levels, or restrictions contained therein.

Plan Monitoring—A system or process of reviews to ensure implementation of the plan, to track the effectiveness of planned management actions and standards and guidelines, to provide additional information, and to track the long-term management of the area.

Plan Revision—A plan modification based on this plan becoming outdated or otherwise obsolete and which involves the completion of a new RMP.

Prescribed Burn—A planned vegetative manipulation using fire to meet certain resource management objectives. The fire is ignited and managed so as to control its intensity and spread.

Primary Jurisdiction Area (PJA)—The area surrounding the dam, outlet works and distribution works, wherein the Reclamation retains primary jurisdiction for the protection, operation, and maintenance of said project facilities.

Private Exclusive Use—Exclusive use is any use which excludes other appropriate public recreational use or users for extended periods of time, including concessionaire- permitted sites on which dwellings or improvements are privately owned, such as a cabin, trailer, or mobile home. Exclusive use occurs when there is not: (1) An established process that frequently rotates users of sites (2) A process which accommodates changes in use, including a process for determining and accommodating other desired uses and resource values

Project Facilities—The water diversion, collection, storage, and carriage facilities, and appurtenant ancillary facilities built by Reclamation or its managing entity under the project authorizing act(s) to fulfill the primary purposes of those acts.

Project Purposes—Those purposes for which a Reclamation project was authorized, as specified in the applicable Reclamation law or laws.

Public Land—(1) Vacant, unappropriated and unreserved lands which have never left Federal ownership (e.g., public domain); also, (2) Federal lands administered by BLM, also, (3) all lands under the custody and control of the Secretary of Interior and the Secretary of Agriculture, except Indian lands (from EO #11644- Use of off-road vehicles on the public lands), also (3) (in broadest sense) lands owned by the Federal, State, or local governments, as opposed to private ownership.

Reclamation—(1) The process of converting disturbed land to its former use or other productive uses; (2) the Bureau of Reclamation

Reclamation Lands or Reservoirs —Lands and reservoir interests under the custody and control of the Commissioner, US Bureau of Reclamation.

Recreation Activity—Recreation activity is a leisure-time pursuit that a person participates in voluntarily to secure a pleasurable experience.

Recreation Benefits- Recreation benefits are the positive gains or improvements made by people participating in recreation opportunities. The gains may include benefits for the individual, community, economy, or environment.

Recreation Experience—Recreation experience is the psychological and physiological response to participating in a particular recreation activity in a specific recreation setting. Recreationists consume a recreation experience (activity + setting = experience).

Recreation Facilities—Those facilities constructed or installed for public recreational use or for support of such use. These facilities may include, but are not limited to, buildings and other structures (such as park headquarters, visitor centers, maintenance shops, shelters, kiosks, etc.,) campgrounds, picnic grounds, boat docks and ramps, electrical lines, water systems, roads, parking areas, sewer systems, signs, trash facilities, boundary and interior fencing, etc.

Recreation Opportunity—Recreation opportunity is the opportunity for a person to participate in a particular activity in a specific setting to realize a particular type of experience and subsequent benefits.

Recreation Setting—Recreation setting is a geographic location composed of physical, social, and managerial attributes where a person participates in a particular activity to have a specific type of recreation experience. Managers manage the recreation setting.

Reservoir Area—In general, those lands and land interests underlying and surrounding a reservoir basin which were withdrawn or acquired by Reclamation for project purposes and which are retained under Reclamation’s jurisdiction.

Resource Management Plan (RMP)—A written document that addresses the existing resources of an area and provides future objectives, goals, and management direction.

Right-of-Way—(1) The right to pass over property owned by another party; also, (2) The strip of land over which facilities, such as highways, railroads, power lines, etc. are built.

Riparian Area or Zone—Land areas adjacent to streams, lakes, or other bodies of water where the vegetation present is dependent on the water table of that water body.

Riparian Habitat—Habitat associated with a riparian zone. Includes both terrestrial (land based) and aquatic (water based) habitat.

Sedimentation—The act or process of depositing soil particles which are suspended in water.

Sensitive Species—A plant or animal species, subspecies, or variety for which a Federal or State agency has determined there is a concern for the species viability, as evidenced by a significant current or predicted downward trend in the population or habitat.

Setbacks—The distance activities that pose a potential threat to the environment must be separated from the feature they threaten (e.g., the proper linear distance that an oil well must be from a flowing stream).

Sociodemographics—Descriptive statistics (means, medians, modes, ranges, etc.) relating the characteristics of a particular population. Population characteristics may focus on a wide range of measures but often include population size, employment by density, unemployment rates, average income and percent of population below poverty level, education, racial background, average age, percent by gender, etc.

Species of Concern—Taxa for which further biological research and field study are needed to resolve their conservation status (USFWS).

Standards and Guides—Written instructions prepared by Federal and State agencies outlining how work is to be accomplished and actions that need to be taken.

Suitable Recreation Sites (acres)—Suitable recreation acres are those acres within a project or planning area that can or will accommodate some type and level of recreation use. Unsuitable recreation acres may be those acres that include security closures, pose public safety hazards, contain sensitive wildlife habitat or heritage sites, have incompatible industrial activity, or are inaccessible because of topography or private land.

Surface Disturbing Activities—Planned activities which change the form or character of the earth's surface. These include such activities as plowing, leveling, excavation, and structure or facility construction.

Surface Water—Water, whether flowing or standing, which is present at the ground's surface (as opposed to ground water).

Threatened Species—A plant or animal species, subspecies or variety that is not currently in danger of extinction, but is likely to be in the foreseeable future. The Secretary of Interior makes this determination for federal listing.

Useful Life—The expected or actual life, whichever is shorter, of a capital improvement consistent with proper maintenance, or the primary term of the existing permit on the property on which the improvement was constructed, whichever period of time is shorter. (Colorado definition from CDOW/CDPOR MOU, 1976)

Vegetative Community—(1) Plant association with immediately distinguishable characteristics based upon and named after apparent dominant plant species (e.g. grassland, shrubland, woodland, forest, etc.); also, (2) Vegetative type.

Vegetative Composition—The various species of plants present in an area, their age, and their relative arrangement within a vegetative community.

Vegetative Condition—The particular state of being of a plant, a plant population, or a plant community. This includes such elements as vigor, general abundance, amount of use, etc.

Water Resources—Water resources is the term used in this guidebook to refer to the types of water resources to which WROS can be applied, including lakes, reservoirs, wetlands, bays, estuaries, rivers, coastal zones, and marine protected areas.

Wetland—An area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. See also Jurisdictional Wetland.

Winter Range—Area occupied by animal species during winter.

Appendix C — Alternative Concepts Open House/Questionnaire Summary

Larimer County
Reservoir Parks Master Plan & Resource Management Plan/EA

Questionnaire #3 Results

5 December 2016

Concepts for improving recreation areas at the reservoirs were developed. The public reviewed the concepts through public meetings in Fort Collins and Loveland on November 16 and 17 and online, with 93 participants at the public meetings. Hard copy and online questionnaires asked the public to help us determine whether the preliminary alternatives are heading in the right direction. Between November 4 through December 3, 2017, 744 people responded to the questionnaires. Tabular results are found on the following pages, followed by comment letters and sign-in sheets.

Table 1: Level of appropriateness for improvements at all four reservoirs:

(1=not appropriate, 5=most appropriate)

	1	2	3	4	5	I don't know
Acquire additional land near existing reservoirs for buffering, expanding recreation sites, and trail connections as new opportunities arise with willing sellers. Purchase new reservoir or mountain properties as opportunities arise with willing sellers.	21 9.2%	7 3.1%	20 8.8%	39 17.1%	124 54.4%	17 7.5%
Introduce nature play areas as part of the campground experience where practical at new and existing campgrounds. Elements could include rock, log and wood structures or other facilities intended to encourage active play without standard playground equipment. An example of this is located at Pinewood Campground.	31 13.7%	20 8.8%	61 26.9%	47 20.7%	59 26.0%	9 4.0%
Expand outdoor environmental education opportunities. Elements may include nature trails, interpretive panels, or nature talks.	19 8.4%	21 9.3%	64 28.3%	57 25.2%	61 27.0%	4 1.8%
Evaluate the condition of all facilities and develop a capital renovation/replacement plan for all recreation sites.	11 4.9%	21 9.3%	42 18.7%	61 27.1%	75 33.3%	15 6.7%
Improve lighting with dark sky (downcast) light fixtures as part of rotating recreation site renovations, with priority to camping areas.	39 17.3%	44 19.6%	42 18.7%	34 15.1%	54 24.0%	12 5.3%
Explore expanded use of web cameras, social media notifications, and/or electronic signs to inform visitors of parking lot availability.	35 15.6%	40 17.9%	67 29.9%	38 17.0%	33 14.7%	11 4.9%
Renovate existing day use areas (restrooms, picnic tables) and restore social trails.	10 4.5%	18 8.0%	57 25.4%	72 32.1%	59 26.3%	8 3.6%
Provide bear proof trash cans.	14 6.2%	21 9.3%	46 20.4%	53 23.6%	78 34.7%	13 5.8%
Update all signage and locate additional signs for safety and swimming/boating hazards at Pinewood and Flatiron.	28 12.4%	32 14.2%	61 27.1%	37 16.4%	27 12.0%	40 17.8%
Continue investigating how to best protect water quality with all involved partners while streamlining the boat inspection process to ensure a pleasurable recreational experience.	10 4.5%	10 4.5%	36 16.1%	51 22.8%	98 43.8%	19 8.5%
Continue to proactively manage vegetation to reduce noxious weeds to encourage native plant populations.	8 3.6%	11 4.9%	31 13.8%	71 31.6%	94 41.8%	10 4.4%
Standardize of all monument signs with Reclamation logo.	61 27.2%	43 19.2%	57 25.4%	19 8.5%	6 2.7%	38 17.0%
Upgrade existing gatehouses with standard gatehouse design, ADA accessibility and include an employee restroom.	38 17.0%	42 18.8%	52 23.2%	42 18.8%	23 10.3%	27 12.1%
Explore locations for a new RV dump station at Flatiron and Carter.	35 16.9%	40 19.3%	44 21.3%	21 10.1%	19 9.2%	48 23.2%

Table 2: Level of appropriateness for improvements at Carter Lake:

(1=not appropriate, 5=most appropriate)

	1	2	3	4	5	I don't know
North Pines Campground: Option 1 Camping (See Concept) ◦ 6-Individual Tent Sites (New and Regraded Existing Sites) ◦ 14- Additional Parking Spaces ◦ 11- Pull Through Trailer Parking Spaces ◦ 15- Additional Parking Spaces by Water Tank ◦ 2- Restrooms ◦ 11- Pull In Trailer Parking Spaces ◦ 1-Floating Boat Storage	20 11.4%	11 6.3%	28 15.9%	33 18.8%	18 10.2%	66 37.5%
North Pines Campground: Option 2 Day Use (See Concept) ◦ 9- Additional Parking Spaces ◦ 12- Individual Day Use Spaces or Walk In Camping Spaces ◦ 11- Pull Through Trailer Parking Spaces ◦ 2- Restrooms ◦ 11- Pull In Trailer Parking Spaces ◦ Day Use Areas ◦ 1-Dryland Boat Storage	34 19.4%	15 8.6%	26 14.9%	19 10.9%	12 6.9%	69 39.4%
North Shoreline ◦ Connect North Pines and Marina with a trail, potentially with aggregate base course along the shoreline. ◦ Add wayfinding and interpretive signage and benches.	19 10.9%	4 2.3%	20 11.4%	35 20.0%	39 22.3%	58 33.1%
Eagle Campground ◦ Construct 3 new cabins. ◦ Construct a wildlife friendly privacy fence to screen residences. ◦ Add campsites west of existing sites in the meadow.	30 17.1%	13 7.4%	29 16.6%	20 11.4%	17 9.7%	66 37.7%
Marina Area ◦ Improve and manage boat pump out on the dock. ◦ Repave/upgrade boat ramps. ◦ To improve parking efficiency, pave and stripe the major parking lots.	13 7.3%	15 8.4%	22 12.4%	26 14.6%	40 22.5%	62 34.8%

	1	2	3	4	5	I don't know
Big Thompson & Quarry Area: Option 1 Day Use (See Concept) ◦ 2-Restrooms ◦ 88-Parking Spaces at Day Use Area ◦ Day Use Areas ◦ Natural Swim Areas ◦ Trail to Swim Areas ◦ 45-Parking Spaces at Trailer Parking Area & Underpass ◦ 35-Boat Trailer Parking Spaces ◦ 1-Underpass from Parking to Floating Courtest Dock ◦ 1-Overlook	21 12.6%	19 11.4%	23 13.8%	23 13.8%	23 13.8%	58 34.7%
Big Thompson & Quarry Area: Option 2 Camping (See Concept) ◦ 9-Electric RV Camp Sites ◦ 1- Restroom ◦ Natural Swim Areas	21 12.9%	28 17.2%	23 14.1%	13 8.0%	21 12.9%	57 35.0%
Natural Swim Area (See Concept) ◦ 1-Restroom ◦ Day Use Area (Walk and Bike In) ◦ Natural Swim Area ◦ Trail to Swim Beach ◦ No vehicular parking	13 7.9%	14 8.5%	19 11.5%	31 18.8%	46 27.9%	42 25.5%
Big Landia (See Concept) ◦ 1-Restroom ◦ 20-Parking Spaces ◦ 20-Tent Pads ◦ 1-Large Group Shelter ◦ 1-Fire Ring ◦ 1-Gate ◦ Group campground by reservation only	14 8.8%	10 6.3%	26 16.3%	23 14.4%	19 11.9%	68 42.5%
Carter Knolls: Option 1 Cabins & RV sites (See Concept) ◦ 6-Cabins With Picnic ◦ 1-Restroom ◦ 12-Parking Spaces ◦ 6-RV Pull Through Sites	26 16.3%	15 9.4%	20 12.5%	14 8.8%	19 11.9%	66 41.3%
Carter Knolls: Option 2 Day Use (See Concept) ◦ 1-Restroom ◦ 32-Parking Spaces ◦ 11- Individual Day Use Spots ◦ 1-Large Group Day Use	18 11.4%	17 10.8%	20 12.7%	16 10.1%	22 13.9%	65 41.1%

Additional comments on potential facility improvements at Carter Lake:

Add showers at the North Pines area.
Additional parking and pull through trailer spaces seem unnecessary. Perhaps nearer the ramp would be useful, though it is rare for even that (closer lot) to fill with day use trailers as guests/fishermen/boaters come for day use.
Area is already over utilized with the camp grounds and number of people. Adding more is just going to make it worse as there is already too much there with the bicyclist and motorist. It is a small area and adding more campgrounds and parking is promoting new problems
As I mentioned to Ken Brink by phone we live just above the quarry on Lakefront Dr. and are totally opposed to any activity in the quarry area. It would be a great risk to our security and safety. It would be very detrimental to our way of life and to the wildlife and any parking there would create very hazardous conditions on the road. We would welcome more walking trails lakeside but definitely not floating dock and concessions. Encourage visitors to use the Marina.
As a resident of Carter Lake for 17 yrs. (on Lakefront Dr.) I protest any more development of the shore line on Carter Lake. Any development at the Quarry or of Big Thompson Areas would be devastating to our way of life and to the value of our properties. Already we hear excessive noise from the new marina and the lake. It is way over the 5.5 decibel limit allowed by the county. Also the pollution caused by to many automobiles and boats is easily apparent, along with road noise. We as residents also are now dealing with people who are not residents coming up the mountain and invading our properties. This is unacceptable. Since the construction of the new marina we no longer see any Elk coming on the mountain, no fox either. It has pushed the deer population up the mountain where we now have an overpopulation of deer causing destruction of our properties. These projects just to mitigate noise would require a sound wall be built 30 ft. high to protect any sound from reaching our
Carter Lake is a clean, beautiful lake with great sailing. My family sails about fifty times a year. We belong to the Carter Lake sailing club and invite others to join us.
Carter lake is a beautiful and appealing place to go for a mountain lake power boat experience close to town. But, it is already too crowded and noisy. Traffic both on the lake and the roads is more than the staff can handle right now. expanding the facilities will only exacerbate the problem. The new reservoir planned above flatirons lake should be designated a powerboat lake to help relieve congestion on both Carter and Horsetooth lakes.
Club house is a delightful historic building - essential to health of the CLSC. It is happily maintained by the members as part of our club work ethic and commitment. Once it is updated or replaced, that feeling will be lost.
Create a plan to manage capacity. Have designated maintenance personnel on site during high use areas.
Don't give Carter Lake the Big City treatment. We like the remoteness, the unimproved so we don't think we are camping in a parking lot.
Don't know why pull through trailer sites are being proposed near the sail club parking. This would

remove parking sites in the area above the sail club slips that often become full on weekends. The pull through sites are so far from the boat ramp, that I doubt whether they would be used by day boaters.

Hiking trail that goes around west side of the lake. Sail clubhouse seems fine and doesn't need remodeled.

I don't see any tent sites at Big T. or Quarry. We have tent camped there and enjoyed it. Can one still tent camp in the RV pull-in spots?

I have witnessed safety related incidents from people climbing on the rocks and having campfires in unauthorized areas over the years

I love Carter Lake. All these options seem viable.

I mainly use Carter Lake for sailing. The lake is wonderful for that use

I'm concerned that in option 2 of North Pines, on the Concept Plan pdf, it has remodeling/replacing the Sail Club building, but there is no mention of this in the written description in the survey. As a Sail Club member, this is the first I've heard of the remodel/replace proposal, and is potentially not a good idea. Many of the plans include a lot of development and expansion. One of the best things about Carter is that it is still somewhat of a rustic, natural venue in more of a "wilderness" setting. Adding lots of cabins, RV parking etc., is going to make it more like a suburban KOA.

It is important to retain the gin pole in its current location and not block access for boats, as the North Pines ramp is the only one well suited to launch and retrieve keel sailboats. I like the idea of both an on water dock for the public near the restrooms as well as dry land locked storage for sailboats and dinghy's. This should attract more day sailors to the lake and maybe help get more weekday traffic. For those of us with sailboats with holding tanks, we suggest the County resume management of the pump out dock. As for the clubhouse leased to the CLSC, we really appreciate the building as it is and are not looking to remodel. It has the rustic charm and natural feel that is what we seek up at Carter Lake. Finally, the docks around the NP boat ramp need a heavier weight as they can drift sideways onto the ramp or way off under wind loads. Thank you so much for accepting public input!

Make the boat pump out more easily accessible and affordable to all people who use the lake.

More hiking and horse trails

More hiking and horse trails, add more swim areas and trails

Mountain bike trails.

Multi use soft surface trail around the lake would be great! Also, connect this to a trail up to Pinewood and Flatiron reservoirs

My vote is to prioritize non-motorized recreation - especially trails but also on-water.

North Pines comments on option #1 by Steve Johnson: 1. Pull through trailer parking near sail club dock area is not needed/necessary/desirable. The two parking areas are on different levels, a good 5ft difference in elevation. Too far from boat ramp. 2. Expanded floating boat storage next to ramp not

needed or desired by CLSC. 3. Additional parking spaces at mast raising pole/gin pole is not good/desirable. Mast raising pole needs to be near ramp/inspection/and easily accessible with large trucks and sailboats. 4. County should take back floating pump out, and should be free as RV pump outs are [illegible]...a little bit out of the norm.

North pines - Concerns about the elimination of the mast raiser and restructuring of trailer parking from the lot next to ramp to far North lot, which is a long walk back to the ramp area.

Our family has enjoyed boating at Carter Lake for 19 years. Our children camped with us on our boat, swam, hiked and played every summer. We value Carter Lake for the family oriented atmosphere and natural beauty where sailboats, ski boats and kayaks can all enjoy water recreation.

Please consider a soft-surface trail around Carter Lake. This would significantly improve the current user-experience and opportunities as well as take some much-needed pressure off of surrounding trail networks, providing Loveland residents additional trail access.

Please improve the boat pump out situation. It was better when the county managed this and we pumped out our tanks on our own.

Provide designated areas for dogs and their owners.

Sailing clubhouse has historic charm - would be ruined if "modernized" other than the addition of bathrooms

Sailing, and occasional camping, is what brings us to Carter Lake. It is an important location in the front range for sailing.

Some features of proposed options are desirable or even necessary, e.g. renovating installations, adding trails, improving marina facilities, and renovating/increasing functionality of sailing club facilities. As a homeowner in the vicinity, however, I strongly object to proposals for large parking lots and significant augmentation of current campsite inventories at the various Carter Lake campgrounds. Such proposals are unnecessary and would in many ways spoil the experience current visitors enjoy. Traffic, noise, and litter are already problems for the residents in the area; the volume of visitors already exceeds reasonable capacity and threatens the natural beauty of reservoir. Campers complain sites are too close together. Campers request more tent sites, if anything -- not more RV/electric sites. The scenic attributes of South County Road 31 are a major attraction currently enjoyed by cyclists, motorists, motorcyclists, and walkers alike. Developing either side of the roadway as

TRAILS! Additional trails. All options ad campsites, cabins, parking but nothing on expanded trails. User options of hiking/ mountain biking are needed if more users are brought into Carter. Carter is woefully underserved in regards to trails when compared to Horsetooth.

The trails on the west side of Carter need to be further developed. The introduction of electricity to several areas is a huge expense and the money could be used to improve the existing facilities.

There are plenty of spaces here now, parking and camping. I am here year round and have never seen 100% of the parking filled here. Camping is popular, and you do have to make advanced booking

to get a site, but the volume of sites is appropriate for the size of the area. More pedestrians on an already narrow road, more traffic when there are so many cyclists (we don't want another accident!), and more littering are not needed. We should improve what we have, not try to pack so many people in here that it becomes dangerous. The lake is full enough with boats, campers, cyclists and hikers, and it's appropriate for the size of Carter Lake. It's pleasant now, even when full. Adding more will make it just over-populated, dangerous and less enjoyable for everyone trying to enjoy the beauty.

Underpasses in Big Thompson & Quarry area option 1 seem very expensive - we are not on I-25 - speed is 25 and 35 MPH.

Up the user fees to pay for improvements. Do not use tax revenues.

We frequently use the North Pines area. The current campsites, it appears, would be eliminated and replaced with tent camping. Those sites are some of the busiest and best on the lake, so I really hate to see the sites disappear, which they would with tent only. I question the need for more trailer parking - it is almost never full - but, if more is needed, the space would be better used with back-in parking (anyone who owns a boat should be comfortable with backing into a parking spot) which would use less space. I really doubt there is room for parking next to the lake for sail club members plus pull through spots. The Sail Club clubhouse works fine for the purposes of the sail club and doesn't need to be replaced. Community activities are already hosted so it is a fairly open facility.

We have had a boat in the marina then sail club since 1997 and love the lake. In our opinion Carter Lake is the premier sailing like in the front range. Carter Lake is a beautiful lake with far cleaner water than the other front range lakes and is more of a mountain lake. When we are up at the lake it feels that we are truly away from the congestion of the front range. We spend the majority of every weekend during the summer at Carter Lake and either stay on our boat or bring up our motorhome and rent a campsite.

Would love to see more soft surface trails built near Carter Lake with an eye toward connectivity among existing trail systems regionally. This will help disperse users, improve access, and plan for the projected population growth by users who want to adopt the outdoors Colorado lifestyle.

Table 3: Level of appropriateness for improvements at Horsetooth Reservoir:

(1=not appropriate, 5=most appropriate)

	1	2	3	4	5	I don't know
Inlet Bay Campground ◦ Add safety signage and wayfinding to reduce conflicts for Inlet Bay Trail users and vehicles. ◦ Investigate potential to improve the functionality of and add a limited number of campsites without using fill from the reservoir.	34 18.9%	23 12.8%	38 21.1%	33 18.3%	25 13.9%	27 15.0%
Inlet Bay Marina ◦ To improve parking efficiency, pave and stripe the major parking lots. ◦ Improve entrance road. ◦ Investigate a potential trailer parking reservation system. ◦ Add flush toilet, new shelter, and replace tree screen near existing docks. ◦ Reconstruct Inlet Bay Marina Store on land and consolidate with remodeled Maintenance Shop. ◦ Increase number of moorings/slips at Inlet Bay Marina. ◦ Replace flag pole lighting to reduce glare. ◦ Construct row boat storage building and dock with partners.	31 17.2%	25 13.9%	30 16.7%	27 15.0%	42 23.3%	25 13.9%
South Bay to Inlet Bay Trail ◦ Add new hiking and mountain biking trail connecting South Bay to Inlet Bay away from sensitive wildlife habitat.	9 5.0%	7 3.9%	19 10.6%	25 13.9%	101 56.1%	19 10.6%
South Bay - Day Use ◦ Improve pit toilets at South Bay boat ramps. ◦ Re-surface and stripe parking lot at boat ramp. ◦ Replace docks. ◦ Repave/upgrade upper ramps. ◦ Investigate opportunities for further site and safety improvements at the South Bay natural swim area.	13 7.3%	21 11.9%	38 21.5%	34 19.2%	38 21.5%	33 18.6%

	1	2	3	4	5	I don't know
South Bay - Campground ◦ Investigate opportunities for additional parking at camping areas. ◦ Investigate opportunities to expand camping without using fill from the reservoir. ◦ Upgrade some existing electric RV sites to full-service hookups. ◦ Replace existing modular cabins that have exceeded their useful life with high quality camper cabins.	32 18.2%	22 12.5%	39 22.2%	22 12.5%	27 15.3%	34 19.3%
Duncan's Ridge/Torture Chamber ◦ Improve signage and information about the area. ◦ Work with City of Fort Collins to maintain parking area at Duncan's Ridge. ◦ Work with climbing community to maintain access and develop a stewardship plan.	9 5.3%	13 7.6%	27 15.8%	46 26.9%	37 21.6%	39 22.8%
Rotary Park ◦ Address nuisance uses. ◦ Increase restoration efforts and fence off restoration areas.	11 6.4%	10 5.8%	29 16.9%	36 20.9%	50 29.1%	36 20.9%
Lower Sunrise ◦ Add stairs into water to help with changing water levels. ◦ Add signage, enforce dogs off-leash/in water regulations.	25 14.5%	20 11.6%	37 21.4%	25 14.5%	35 20.2%	31 17.9%
North of Horsetooth Dam (See Concept) ◦ 40-Parking Spaces ◦ 1-Large Group Use Area & Shelter ◦ Gate - Locked gate when archery range closed ◦ Habitat improvements ◦ Archery Range at disturbed area ◦ Single track trail with 3D targets along trail ◦ Archery Ranger would be day use; additional fee for 3D target loop. ◦ Safety would be a priority in the design (target distance, terrain shielding, etc.)	33 18.8%	20 11.4%	27 15.3%	27 15.3%	34 19.3%	35 19.9%

	1	2	3	4	5	I don't know
Satanka Bay (See Concept) ◦ ~90-Trailer Parking Spaces, to be phased based on demand. ◦ 900' Road access from Satanka boat ramp to parking near base of Dam. ◦ 1200' access trail from parking to top of Dam with switchbacks up ridge. ◦ Paddle Board Launch Area. ◦ For peak use during high demand days such as weekends and holidays.	28 15.9%	24 13.6%	33 18.8%	22 12.5%	30 17.0%	39 22.2%
Boat-In Access on West Shoreline Coves ◦ Plant natural vegetation to screen Dixon Cove outhouse. ◦ Improve shoreline trail. ◦ Add composting toilets at South Eltuck and North Eltuck Coves. ◦ Add two new mulching toilets in the coves for day use.	17 9.7%	22 12.5%	26 14.8%	51 29.0%	31 17.6%	29 16.5%
Blue Sky Trailhead ◦ Plant vegetation to screen parking lot	32 18.1%	22 12.4%	37 20.9%	29 16.4%	32 18.1%	25 14.1%
Pineridge/Fort Collins to South Bay Trail Connection ◦ Investigate opportunities to work with other County Departments to improve bicycle access and public safety along CR38E to Horsetooth Reservoir	11 6.4%	9 5.2%	21 12.2%	23 13.4%	86 50.0%	22 12.8%
Other Trails ◦ Continue to acquire land or easements to complete trail connections between Fort Collins and Horsetooth Reservoir on a willing seller basis	12 6.9%	13 7.5%	17 9.8%	19 11.0%	92 53.2%	20 11.6%
Resource Enhancements ◦ Remove old fences on east side of reservoir to reduce wildlife barriers and mortality. ◦ Investigate limited opportunities for waterfowl hunting in remote areas during low use seasons.	28 15.9%	14 8.0%	29 16.5%	34 19.3%	47 26.7%	24 13.6%

Additional comments on potential facility improvements at Horsetooth Reservoir:

More hiking and horse trails
"Construct row boat storage building and dock with partners" is my primary concern, however, I like many of the other ideas as well.
"The purpose of the RMP/EA is to balance natural resource protection with recreational opportunities, provide a diversity of recreational experiences, ensure financial stability, and account for future growth and demand. The integrated RMP/EA would replace the 2007 documents and establish a 10-year plan detailing the management framework for the conservation, protection, and enhancement of the four regional reservoirs and surrounding lands." The Horsetooth Reservoir Inlet Bay area today is not being conserved, protected or enhanced. We must all understand what these words mean in the minds of the decision-makers as distinct from the minds of concerned residents. Concerned residents see the Inlet Bay area as overused and over-crowded. Visitors leave trash. Trails are no longer enjoyable. The quality of life for which we moved here is gone. If the state of the park is not addressed so as to actually balance natural resources with the desire for economic gain, good residents, too, soon
1. As use of our trail system becomes more congested with multi-activity users and conflict arises, design of trails separating users becomes more critical. 2. Cyclists give back to the local trail systems by volunteering on public land, protecting the environment and preserving open space. 3. A better connected trail system would provide access to surrounding open lands without the need to drive, thus helping reduce traffic congestion, strain on trailhead parking areas, air pollution and negative automobile-bicycle interactions. 4. Increased soft and hard surface trail opportunities will help disperse users, improve access for regional residents and visitors, and reduce strain on the current trail system 5. Well-designed trails will encourage trail users to stay on trail and lessen impacts to our natural resources. 6. Cycling tourism has proven to greatly increase the economic vitality of communities with a high-quality multi-use trail network designed to accommodate all ability-
A boathouse at Horsetooth will greatly increase the effectiveness of Colorado State Crew as well as reducing the wear and tear on our equipment. Colorado State Crew is fortunate enough to be able to use Horsetooth as our training ground and this addition will greatly expand our team and our affiliates.
Add connector trail from north Horsetooth to Lory
Add hiking and mountain biking trail connecting from near CR 23 and 38E intersection to South Bay to Inlet Bay.
Additional camp sites are not needed at this county park, it is already at capacity. I would like to see additional information on how water quality will be monitored in relation to boating activities. All I see in the recommendations is based on invasive species (which is needed) but doesn't address other boating related water quality issues. I also think that as more area is paved, LID (Low Impact Development) techniques to improve water quality should also be implemented. I think there should be fee increases for non-county users. I really like the idea of improving the Marina store. I'm not opposed to more boat slips if they bring in revenue, however, again I think there should be more information on how boat numbers are limited on the reservoir. It is starting to be a safety hazard on

weekends with the number of boats on the reservoir. I'd also like more information in this plan on how revenue for Horsetooth is used at this park versus being used at the other sites. My

Already way too many moorings which clutter the bay.

As a member of Fort Collins Rowing Association for 11 years now, I have seen our community rowing group grow nearly every year. Our Juniors program is growing, creating rowing scholarships for some of our kids. CSU crew, while still a club sport, has been a good learning opportunity for CSU kids to be e posed to this sport that otherwise not have the opportunity. The CSU program has one notable alum, who is now coaching the University of Connecticut's rowing program; producing exceptional results. We are a registered non-profit, committed to bringing this fabulous sport to this community!

Beaches were ruined due to last “improvement" . Need better beach area AWAY from boat docks. Who wants to take their children to the beach where little ones can't go into the water gradually due to rocks and are inhaling fumes from boats all day??? Terrible design. Beach and volleyball is under water except for winter--who's "bright" idea? Need no more "improvements"--especially paving. Fumes from boats AND blacktop--not an enjoyable experience. Also, signs should be posted warning campers of herbicide application. And please update the signage regarding mercury and fishing at the marina--there should be more signage warning fisherman/women in numerous places regarding the dangers of eating the fish they are catching. No more campsites--you are squeezing campers in as it is--not enjoyable to be camping so close to others

Boaters have made it very difficult for non-boaters to enjoy the reservoir. Swimming in the reservoir is very unpleasant as you can taste gasoline. The noise pollution (music, engines, etc.) have taken away from the beauty of the area. There are few areas that are actually safe and welcoming to children. Please keep this place serene for all of the residents. We appreciate your consideration.

Charge user fees to the people that use the trails and parks. Make them pay for the improvements and upkeep. Do not increase taxes to pay for anything.

Comment about boathouse for rowers: We have engaged our community through a very successful junior athletic program; adaptive; adult program, a boathouse will allow us to expand that outreach. Additionally, our current outdoor Winter storage is very rough on our equipment and we had security issues last Summer which a boathouse will eliminate. Thank you.

Connector trail from Foothills Trail to Lory north of the dam would be great too!

Connector trails to blue sky and Lory would make the park more accessible.

Construct a boathouse for the Fort Collins Rowing Assn. Will allow us to expand outreach to our community through the following programs: a very successful junior competitive program, adaptive rowing, adult and adaptive for people with disabilities. Current boat dock is small for the growing participation. Winter, wind and heat is very rough on our equipment. We had a security issue with theft and vandalism this at a cost to repair/replace. A covered boathouse will enhance our program to be year round with indoor training. We need your support to outreach the increasing demand of this growing sport. We host an annual regatta bringing rowing clubs from neighboring states with over 100 visitors and paid fees. We are an essential client of the Marina.

Creating a new area for row boat storage would be an incredible factor in improving the lives of countless people for years to come.

Develop a single track north damn connector trail from reservoir ridge to Satanka Cove to Lory trails. Also, develop a south end connector trail from Pineridge to Inlet bay/Blue Sky trails.

Empty the outhouses more frequently. The smell peaks early in the season and never lets up! Trails connecting the city to the east side of Horsetooth reservoir would be wonderful for bikers looking to avoid the busy road, and would cut down on cars heading to the parking lots on the east side.

Especially favor "construct row boat storage building and dock with partners"

Expanded soft surface/singletrack trail access should be a top priority. A safe way to ride to and from the trails will cut down on parking congestion and make our trails more appealing as a destination for mountain bike tourism.

Fantastic work on the new visitor center.

Have you actually seen this place during the summer? It is a crowded, dangerous, nosy motorized circus, and this is already true without some of the proposed "improvements" which will only make the area more of a circus. Where does nature go to hide? What about silence or at least quiet time, opportunities for contemplation away from the much-increased and crowded hub-bub of Fort Collins? These proposed changes are WAY too much. Please don' do this, and--especially--please do not put in an archery range so close to homes. Thank you.

Having a boat house with potentially more space to store boats available to rowers would be amazing!

He supports the archery range, having served as president of the archery club years ago in high school. He also understands the appropriateness of additional parking at North Dam. However, he was unsettled by "the absence of a strategy to resolve the increased conflicts between paddle sports and motorized boats" noting that increasing parking for both trailers and day users would only increase competition for limited water. He hopes to see some commitment to a non-motorized cove for paddle sports for public safety and experience. He supports additional land acquisition for water sports. He advocated for grassland, wetland, and cottonwood restoration at both the trailer parking and archery areas to offset the visual change. He left with a comment form and may complete it online, indicating he would follow up with some of the more outspoken Bellevue residents.

Horsetooth Reservoir and Horsetooth Mountain Park/Open Space are so over-crowded that it seems we need more parks, not more parking lots, boat slips, and campsites at the existing parks. I strongly favor massive acquisition of more park lands!

Hunting in the vicinity of any reservoir in Larimer County seems a serious risk to everyone. Please do not give that any further consideration..

Hunting should not be allowed anywhere near the Reservoir. It's too dangerous.

I am a homeowner at 1105 Satanka Trial. The proposed 90 parking spaces at the north end of Horsetooth would severely limit wildlife access through this area. We have groups of deer who move

back and forth through our neighborhood daily. This would also be an area that would be difficult to patrol. There is already a problem with late night vehicles racing and doing donuts in the existing parking lots. Please don't consider this option. I am also concerned with the proposed archery location for all of the same reasons I have already mentioned

I am strongly opposed to changes that will lead to increased motorized use at the north end of the reservoir. As a nearby resident and a kayaker, I value the relative quiet of this end, and I already find kayaking difficult with all the motorboats, never mind more. The archery range seems like a really bad idea, given the houses adjacent and the number of bicycles and runners that pass by that space, whereas the current small pond is a pleasant refuge for birds and passing humans.

I can't comment with any real knowledge on Horsetooth.

I know Horsetooth is the third busiest reservoir in Colorado, so thank you for your attention to maintaining the integrity of the park. We live in Bellvue, and we don't want further development of our open spaces, but we want our open spaces to remain OPEN. Please do not add campgrounds ANYWHERE on the north side of the reservoir. Noise, dust, and light pollution are extremely unwanted by local residents. Please help keep Horsetooth from being loved to death!!! Thank you!

I live in the neighborhood adjacent to Satanka Cove. I have serious concerns about the proposed 90 trailer spaces as well as the archery range and 40 space parking lot. Wildlife come through our area daily and the proposed parking and fencing would put an end to this corridor. It is interesting how other parts of the questionnaire offer suggestions to eliminating fences to enhance wildlife and to lower mortality. I am also concerned about the added congestion that the 90 spaces would add to the boat launch area. I can't see how adding parking will enhance the experience when all the extra vehicles and trailers would be trying to load or unload at one boat ramp (in addition to the increased number of paddle boarders). The vehicles would be coming from 2 different directions as well as the 2 lane traffic on the road leading to the parking lot. The potential dust and pollution from idling vehicles would be a detriment to the area. I understand this parking would add additional revenue a

I rarely go to Horsetooth Reservoir in the summer. The lake is full, drivers are out of control and just overall way to many people. It seems the county wants to extend that terrible reputation to Carter Lake and I'm opposed. We need to enhance the beauty and usability, not build for the masses and drive increased visitors beyond the size of these areas.

I strongly discourage the development of an archery range North of the dam, as the depiction shows archers aiming their arrows at my property, within 500 feet from my deck. I am concerned about the safety of my children, llamas and alpacas, as a community Emergency Physician. I am concerned about the devaluation of our home. I also discourage adding more boat parking, as the lake is already over-used and dangerous. I propose a natural area with an indoor facility where children can learn about nature with hands-on learning area for area schools to utilize, an audio guided nature hike, a geological hike, bird watching and viewing area, dedicated biker parking for the area bikers, dedicated fishing area, a paved area for the disabled and handicapped to enjoy nature, restoration of the BMX damaged landscape. There are many revenue streams within these ideas, which as a MBA and entrepreneur that I can help you to brainstorm, if this is the County's goal. Let's build something that embraces

I think you should prioritize trail building and trail connectivity. I am a trail runner, hiker and mountain biker and for all those user groups the trails are getting crowded. I also think prioritizing parking or a shuttle system would be good. It would also be nice to have an expanded open water swim area as otherwise triathletes must drive to further away reservoirs in order to train in open water.

I'm not familiar with Horsetooth Reservoir so I didn't think it was appropriate to choose options for that reservoir.

Improve environment for non-motorized water recreation Larger swim areas restricting motorized boats Provide areas for dog friendly swim access

It makes more sense to develop the areas around Horsetooth and to keep Carter more of a natural experience.

It seems like history is repeating itself in Bellvue again, given the county's desire to attract non-residents to our area that doesn't have the space or infrastructure to deal with the influx. AND…once again, it is unfortunate that the communication from the county about this plan was non-existent. We have been told many times by Mark Coughlan, Garry Buffington, and other officials that we would be the first to be notified when new ideas, plans, or meetings took place regarding the duck pond/north dam area. However, none of the immediate neighbors was notified about the expansion and development plans. Instead, we found out when a neighbor noticed a gathering of 15 to 20 individuals walking around surveying the land and we went up there to investigate. It is more like, "Let's send a notice to everyone but them," as residents farther away from the immediate neighbors did receive notice. I realize the Parks Department has a job to do with developing recreational use for e

It would be great if the marina allowed sailboats to have slips. Isn't this supposed to be a public marina?

Make Chimney Hollow a power boat lake.

More mountain bike trails on existing land. Directional, bike-only trails rotating trail usage (hiker/biker) odd/even day.

More trails for hiking/biking and more connectivity amongst trails to encircle the reservoir

More trails!

My black labs have been swimming at Horsetooth for 18 years. Please do not take away the 1 place in town where she is free to be a dog. I think the dog parks are dirty, small, and inadequate. I also worry about her safety at the dog park due to the occasional aggressive dog I have seen there..

My vote is to prioritize non-motorized recreation - especially trails but also on-water.

Natural surface trail from city of Fort Collins to Blue Sky trail. Additional loop trails around South Bay to Inlet Bay connector trail.

Natural surface trail from city of Ft. Collins to blue sky. Additional trails on Peninsula to disperse crowds.

No additional camping sites at Inlet Bay. The traffic situation is already bad for local property owners on days with high use. There are times when traffic is backed up onto Shoreline Drive making it impossible for homeowners to get to their homes near the north end of the lake.

Not sure waterfowl hunting is a good mix with other Horsetooth recreation.

Number of campsites should not be increased. Instead, focus on improvements to enhance user experience -- as most of the proposed measures aim to do.

PLEASE BUILD MORE TRAIL!!!

Please consider additional soft-surface trail opportunities around the entirety of the reservoir.

Please consider trail maintenance and additional trail connections for mountain biking. The park is exceptional mountain biking terrain and very popular. Additional trail networks in the park and especially between blue sky trailhead and south bay would be very popular.

Please keep working on trail around entire reservoir--this would be a wonderful amenity for mountain bikers and decrease the number of cars parking at the various trail heads since bikers could access the trails from town rather than driving and parking at the various parking lots around Horsetooth that are often full. Also please work on the Pineridge/Fort Collins to South Bay Trail Connection. Also South Bay to Inlet Bay trail.

Please make a directional trail at Horsetooth Mtn Park. This has been widely popular in several areas in Colorado and the rest of the U.S.. Please make challenging trails.

Riding my bike from town to Horsetooth is quite dangerous. This needs to be addressed. It should have been addressed with the recent repaving.

Strongly support partnership to provide building for storage of rowing shells.

The county should look into buying the little store on the south side of County Road 38E (near the Stout sign) to use as a camp store / office / rentals store. It seems like the store has a new owner every year.

The way many of these questions are broken out didn't allow the opportunity to say yes to one point and no to others and vice versa. As an example... Resource Enhancements.... sure.. remove fences and reduce wildlife barriers and mortality. HOWEVER... I don't agree with waterfowl hunting, limited or otherwise... So.. makes it difficult to answer.. I can do what I think is ok for the deer but only if I am ok with guns being used in an area where, based on this survey, you are considering adding more human population. How does this even make sense?? Speaking for the Horsetooth area, yes.. the population of Fort Collins has grown dramatically in the last 45 years of my life here... and the city can deal with that, because it's a "city". Adding more parking lots and campgrounds to accommodate this population boom at Horsetooth makes zero sense to an area that you are simultaneously saying you want to protect. Honestly, has it occurred to anyone on these master plan teams that even

The way this survey is constructed gives the public no real ability to bring distinction to the proposed plans. Disparate items are grouped in a way that makes no apparent sense, and there is no ability to be for one element and against another.

There are few concrete plans in this Master Plan to increase existing soft surface trails. This is an important component to manage the increased use that population growth brings over the next 10 years. A soft surface trail system from town, around the south end of the reservoir, linking to Blue Sky and continuing south into Loveland would reduce the need to drive to these areas, thus helping alleviate congestion at trailheads and reducing unsafe bicycle/vehicle interactions on heavily traveled roads. Focusing on connectivity among existing trail systems would really help disperse users, improve access, and address the projected population growth by users.

There is an existing issue with boaters and vehicles that go through Bellvue now. The proposed additions to Satanka and the archery range will only add to it. The county needs to think about the impact on neighbor hoods with small children, pets and the quality of life that have a road going through them. The corners at Co. Rd. 54 and Co.Rd 23 and Bingham Hill and Co. Rd 23 is dangerous now and hauling more large boats through that intersection will just make it worse! These are problems that need to be addressed first!

This page does not show level 4 & 5 scoring. All my level 3 should be 5. Your photo hides the scoring slots. Please DO NOT PAVE THE MARINA PARKING LOT. not needed & too $$ maintenance !! Please provide a boat house for FCRA to better engage our community through a very successful junior athletic, adult and adaptive programs. Current boat dock houses boats where winter storage, wind, sun decays equipment. Security issues of theft & destruction existed this year. A boathouse will eliminate this. FCRA hosts regattas bringing in $$ and over 150 visitors to the park on a single day. FCRA Junior Crew achieved National status and 2 juniors won rowing SCHOLARSHIPS to multiple state universities. Increased popularity and participants demand more equipment and indoor facility to enable improved community service! Thank you very much!

To increase parking on the north dam will also increase the number of boats, waiting to use the ramp, traffic on the north side of the reservoir, noise and idling trucks in a residential area. Can we set a limit on the north side to the number of motorized boats and cater more towards paddleboards and non-motorized crafts? Since there are more and more non-motorized watercraft (paddleboards, kayaks, canoes, etc.) can we focus the efforts on providing access and protected "lanes" and coves in the water. As well as active enforcement of aggressive, drunken boating? Archery area and parking north of the dam: providing access to the north side of the dam is a security risk. The north side of the dam should be protected from public access. The proposed archery area puts the residents and livestock on the west side of the area at risk to wayward arrows. Can we use this area for something less lethal and needed in the area? An ADA interpretive hike would be low impact and less dang

Trails are important to me! Let's build a circum-Horsetooth Reservoir trail to connect city and county and state trail systems.

Very disappointed in the formulation of alternatives at Horsetooth - repairs/maintenance is only packaged with expansion of use. Why no options to repair/maintain existing infrastructure WITHOUT expansion of use? Example: Inlet Bay Marina - I support enhancements, but NOT expansion of moorings/slips. This survey fails to identify public desire for enhancements versus expansion. Another example - South Bay Campground. I support enhancement of existing campground, but NOT expansion of the campground. Staff told me it was only a rumor about expanded campgrounds, and here we see that the public is not given a choice between

improvements versus expansion. Shame on whoever formulated these sham options! Resource Enhancements - very disappointed that hunting is packaged with removal of wildlife barriers. I support removal of barriers but NOT waterfowl hunting. Waterfowl hunting is not a resource enhancement.

Would much rather a disc golf course instead of an archery range, existing courses are either overcrowded, unplayable because they are located in drainage ditches or next to schools, which can't be played during the day. Please please No more parking for motor boat launches at Satanka ramp, a safe area free of motor boats for paddle boats is needed. Bike trail is needed over reservoir and Bingham hill road

south bay - food trucks in summer on weekends and improved high water and late season beach conditions. No more campsites, crowded enough. Streamline in an out procedure for boats. Enforce no dog rule at swim beach. thank you. keep up the great work

Table 4: Level of appropriateness for improvements at Flatiron Reservoir:

(1=not appropriate, 5=most appropriate)

	1	2	3	4	5	I don't know
Campground ◦ Upgrade campground amenities. ◦ Improve group use area and campground education facility. ◦ Address flooding issues by upgrading culverts.	10 6.4%	13 8.3%	19 12.2%	25 16.0%	20 12.8%	69 44.2%
Gatehouse ◦ Upgrade existing gatehouses with standard gatehouse design, be ADA accessible and include a restroom.	13 8.3%	20 12.7%	18 11.5%	18 11.5%	19 12.1%	69 43.9%
Other Improvements/Actions ◦ Update identification sign and kiosk area. ◦ Add additional signs for safety, explanation of why swimming is not allowed. ◦ Fishing etiquette signs. ◦ Pedestrian connection from Natural Resources Administration Building to Cheyenne Day Use Area. ◦ Evaluate ADA compliance and opportunities.	8 5.1%	14 8.9%	22 14.0%	30 19.1%	18 11.5%	65 41.4%

Additional comments on potential facility improvements at Flatiron Reservoir:

Response
Access to Chimney Hollow via trail.
Building soft surface trails which connect Carter Lake, Flatiron Reservoir, Pinewood Reservoir and Chimney Hollow, linking these into a larger network of regional trails.
Can't comment on Flatiron.
Creation of designated dog swim beach.
Flatiron seems such a beautiful and peaceful location for kayaking and possibly NON-MOTORIZED fishing boats. Please consider allowing this form of boating. Size of boat restrictions could also help control impact.
I support all of these initiatives as either necessary or desirable.
Make Chimney Hollow a power boat lake.
More hiking and horse trails
More hiking and horse trails needed
Mountain bike trails.
On all areas add a sign about protecting them against bear and cougar attack. Make sure everyone is aware they should not be wandering around alone after dark. Take a companion to go to the restrooms and such.
This form should include a phone # and an address for returning this form. Also your website does not work and many sites cannot be opened. I am most disappointed on why you would need to know my income!! AB

Table 1: Level of appropriateness for improvements at Pinewood Reservoir:

(1=not appropriate, 5=most appropriate)

	1	2	3	4	5	I don't know
Fisherman's Cove Day Use Area ◦ Add exit/entry to parking lot on south side of parking lot. ◦ If necessary for dam security, add future trailhead below dam and improve trail sustainability to Fisherman's Cove Parking.	9 6.0%	9 6.0%	16 10.7%	29 19.3%	24 16.0%	63 42.0%
Launch and Parking Area ◦ Replace ramp with new 60 foot boat ramp. ◦ Improve safety and add signage near dam area.	12 8.0%	21 14.0%	24 16.0%	17 11.3%	13 8.7%	63 42.0%
Pinewood Campground ◦ Provide bear proof trash cans.	5 3.3%	13 8.6%	13 8.6%	26 17.2%	42 27.8%	52 34.4%
Blue Mountain Area ◦ Upgrade day use area. ◦ Add no swimming signage near penstocks / siphon area, change safety rope to indicate danger.	10 6.6%	10 6.6%	15 9.9%	28 18.5%	26 17.2%	62 41.1%
Other Improvements/Actions ◦ Add self-service kiosks. ◦ Add letter signs for safety. ◦ Currently a wakeless boating reservoir; Reclamation is considering making a non-motorized reservoir.	16 10.6%	12 7.9%	11 7.3%	28 18.5%	29 19.2%	55 36.4%

Additional comments on potential facility improvements at Pinewood Reservoir:

Add locking gate to north end of 18E to keep Park users from overflowing into the local residential properties. This is currently a significant problem and over 60 unattended fires have been found this year on property outside the authorized camping area. Residents, mail delivery, BLM, and other authorized users would be given access.
Building soft surface trails which connect Carter Lake, Flatiron Reservoir, Pinewood Reservoir and Chimney Hollow, linking these into a larger network of regional trails.
Can't comment on Pinewood
Expand hiking and horse trails
I like the idea of non-motorized.
I support all these initiatives, viewing all as either necessary or highly desirable.
IMBA style sustainable trails on downhill sections of current trail system would help with erosion.
Make Chimney hollow a power boat lake.
More hiking and horse trails
Mountain bike trails.
No more killing of prairie dogs here!
There are limited areas to utilize boats in this area, we should continue to allow for non-motorized boats at Pinewood. Further, if we develop the new reservoir Chimney Hollow, that should allow motorized boats to spread boat volume from Horsetooth and Carter Lake.
Wakeless boating at several reservoirs in Larimer County is a welcomed concept. Thanks for looking at that option!
Why in the samhill are you expanding an archery range to within 150 yards of a neighbor's property with his animals and people on his dock at risk for death?

Respondent Information:

Responses:

	Count	Percent
Complete	496	66.7
Partial	248	33.3
Disqualified	0	0
Total	744	

Zip Code:

Count	Response	Count	Response
72	80537	1	80303
63	80538	1	80305
59	80526	1	80308
42	80525	1	80403
36	80524	1	80521-4605
33	80521	1	80527
29	80634	1	80531
26	80512	1	80534-8472
20	80513	1	80535
16	80528	1	80536
9	80534	1	80540
9	80550	1	80541
3	80631	1	80543
3	80644	1	80547
2	80301	1	80634-4230
2	80501	1	80635
2	80503	1	80701
2	80504	1	80921
2	80550-7058	1	82001
1	69033	1	85743
1	80003	1	89119
1	80033	1	89121
1	80122	1	89526
1	80127	1	90022

1	80132	1	99709
1	80230		

Affiliation:

Count	Response
41	Loveland Swim Club/ Greeley Swim Club
16	Team BOB, NCGR, OMBC, FoCo Trails Advocacy Group
13	Colorado State University Crew
10	Fort Collins Rowing Association
8	Carter Lake Sailing Club
8	Resident
6	CLSC
4	Carter Lake Sail Club
2	Bellvue Resident
2	Colorado State Crew Team
2	Ft.Collins Rowing Association
2	Carter Lake resident above proposed development
1	4-H and dog clubs
1	4H superintendent, leader and parent
1	Board member of Loveland Swim Club
1	Calderazzo
1	Carter Lake Sailing Club and live above Inlet Bay on HT
1	Carter Lake Sailing Club, Commodore
1	Competitive swimming
1	DRM Real Estate Advisors, LLC/The GROUP Real Estate, Inc
1	Eddy
1	FCHS alumni
1	Foothills Swim Team
1	Fort Collins Trail Runners
1	Friends of Larimer Parks
1	LCDNR
1	Lake View Cottages
1	Lake user, boat storage
1	Larimer County Parks Advisory Board Member
1	Loveland
1	Mountain biker/cyclist
1	Resident above Horsetooth Lake also member of Carter Lake Sailing Club
1	Resident on Lakefront Dr.
1	Serrano
1	Sirius athletes
1	Tunner
1	University Swimmer

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
Felix Rojas	frojas@fai'l.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
LARRY BRISKI		80537	The Ranch Master Plan Reservoir Parks Master Plan
Cathy Parkhurst	cp/ou@comcast.net	80538	The Ranch Master Plan Reservoir Parks Master Plan
Norm Smith	norman@LPBroadband.net	80537	The Ranch Master Plan Reservoir Parks Master Plan
Paul Friesen	PaulFriesen@Live.com	80634	The Ranch Master Plan Reservoir Parks Master Plan
John Clarkson	JohnClarksonMail@Gmail.com	80513	The Ranch Master Plan Reservoir Parks Master Plan
Pam Robertson	Robertson1001@hotmail.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Dan Gately	dagately123@gmail.com	80513	The Ranch Master Plan Reservoir Parks Master Plan
Sarah K Smith	skimmett@aol.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Marilyn Hilgenberg	marilyn.hilgenberg@cityofloveland.org	80538	The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
Jim Nickell	jimnickell@Hotmail.com	80538	The Ranch Master Plan Reservoir Parks Master Plan
Tyler Bush	bushman135@gmail.com	80527	The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
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			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (~~Circle one or both~~)
Chris Johnson	ceyohnson72@gmail.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Kenny Bearden		80525	The Ranch Master Plan Reservoir Parks Master Plan
Claudine & Tony Szwaja		80537	The Ranch Master Plan Reservoir Parks Master Plan
Allyn D		80537	The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
Krishna Kachur	kekachur@gmail.com	80524	The Ranch Master Plan Reservoir Parks Master Plan
ALISSA + BRETT CLOUSING	alissa.clousing@gmail.com brett.clousing@gmail.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Bob CAROLYN	RCAROLAN73@YAHOO.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
J. David Phegley	davephegley@hotmail.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Josh Tobey	joshuatobeystudios@yahoo.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Gil Barela	barelanba@yahoo -		The Ranch Master Plan Reservoir Parks Master Plan
Bonnie Briski	bonebk@AOL.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Barry Gustafson	Barrygustafson1@gmail	80537	The Ranch Master Plan Reservoir Parks Master Plan
Sandy Coyle	dandy12@mindspring.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
SHANE WOOD	SHJWOOD@GMAIL.COM	80513	The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
STEVE SOVAIKO	oak2106 @ gmail.com	80526	The Ranch Master Plan Reservoir Parks Master Plan
Jim Struble	jstruble@northernwater.org		The Ranch Master Plan Reservoir Parks Master Plan
Jim Pendleton	jmspndltn05@AOL.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Josh Campbell	jshay99@gmail.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Jody Shadduck-McNally	jlsmcnally@gmail.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
JOE DELICH	JOSEPH@DELICHASSOC.com	80538	The Ranch Master Plan Reservoir Parks Master Plan
Lisa Coalwell	lisacoalwell@gmail.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
CAT CURTIS	LCCCDLC@MSN.COM	80537	The Ranch Master Plan Reservoir Parks Master Plan
Jeff Shamley	jeffshamley@gmail.com	80537	The Ranch Master Plan Reservoir Parks Master Plan
Steve + Sharon Goodroad	SUMMERHILLTREELLC@GMAIL.COM	80537	The Ranch Master Plan Reservoir Parks Master Plan

The Ranch Events Complex Master Plan
Reservoir Parks Master Plan & RMP/EA

www.onegreatcountytoplay.com

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
Stuart Culp	stuartculp@frii.com	80526	The Ranch Master Plan Reservoir Parks Master Plan
Lisa Ashbach	Samaia@earthlink.net	80512	The Ranch Master Plan Reservoir Parks Master Plan
Ernie Snyder	JGonza1021@msn.com	80512	The Ranch Master Plan Reservoir Parks Master Plan
GORDON SMITH	GORDON.SMITH.1012@GMAIL.COM	80526	The Ranch Master Plan Reservoir Parks Master Plan
WALTER DAUKSHER	DAUKSHER@COMCAST.NET	80525	The Ranch Master Plan Reservoir Parks Master Plan
Thomas Kent	Kent@AVIPC.com	80524	The Ranch Master Plan Reservoir Parks Master Plan
Joan R. Fyke	JGonza3020@MSN.com	80512	The Ranch Master Plan Reservoir Parks Master Plan
Mitch Wood	mwood_84@yahoo.com	80525	The Ranch Master Plan Reservoir Parks Master Plan
Craig Yonkers	YonKonian@gmail.com	80521	The Ranch Master Plan Reservoir Parks Master Plan
Nick Bohlig	Nick.Bohlig@gmail.com	81525	The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
Tyr Johanson	tyrjo@yahoo.com	80526	The Ranch Master Plan Reservoir Parks Master Plan
Georgia Gould		80521	The Ranch Master Plan Reservoir Parks Master Plan
Dusty LaBarr		80521	The Ranch Master Plan Reservoir Parks Master Plan
Marty Malensek	marty.mhm@gmail.com	80525	The Ranch Master Plan Reservoir Parks Master Plan
Tim Dorsam	mitmahpu@msn.com	80526	The Ranch Master Plan Reservoir Parks Master Plan
Julie Bort	jrbort@comcast.net	80521	The Ranch Master Plan Reservoir Parks Master Plan
Eric Stevens	EricEStevens@yahoo.com	80525	The Ranch Master Plan Reservoir Parks Master Plan
Pat Kelly			The Ranch Master Plan Reservoir Parks Master Plan
Brad			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
Jake Wilson	jwilson@avipc.com	80522	The Ranch Master Plan Reservoir Parks Master Plan
Matt White	mtwhite1@gmail.com	80526	The Ranch Master Plan Reservoir Parks Master Plan
Brian Lackey	brian@outdoorinteractivellc.com	80525	The Ranch Master Plan Reservoir Parks Master Plan
Doug Prince	dprince81821@msn.com	80512	The Ranch Master Plan Reservoir Parks Master Plan
Mary Homan	mhoman@fizil.com	80525	The Ranch Master Plan Reservoir Parks Master Plan
Howard Hissrich	Howard.Hissrich@ms.com	80528	The Ranch Master Plan Reservoir Parks Master Plan
Doug Baker	feathod@gmail.com	80521	The Ranch Master Plan Reservoir Parks Master Plan
Andrea Agnew		80521	The Ranch Master Plan Reservoir Parks Master Plan
Henry Horrocks	saltangtr@gmail.com	80521	The Ranch Master Plan Reservoir Parks Master Plan
Sara Kammlade			The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
Bob Gesumaria	bob.gesumaria@gmail.com	80538	The Ranch Master Plan Reservoir Parks Master Plan
Graham Long	grahamlong-81@yahoo.com	80535	The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
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			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
Airn Hartwig	airn.tolnay@gmail.com	80541	The Ranch Master Plan Reservoir Parks Master Plan
Kent Leier	kentjleier@gmail.com	80525	The Ranch Master Plan (Reservoir Parks Master Plan)
Brad Bishop	brad.b.bishop@gmail.com	80525	The Ranch Master Plan Reservoir Parks Master Plan
Neal Spencer	Neal@usa.net	80512	The Ranch Master Plan Reservoir Parks Master Plan
Katherine Edelblut	kedelblut@gmail.com	80524	The Ranch Master Plan (Reservoir Parks Master Plan)
Mitch Cook	mitch72732@gmail.com	80537	The Ranch Master Plan (Reservoir Parks Master Plan)
Denise Pumfrey	denisepumfrey@yahoo.com	80537	The Ranch Master Plan (Reservoir Parks Master Plan)
John Pumfrey	johnpumfrey@yahoo.com	80537	(The Ranch Master Plan) Reservoir Parks Master Plan
Erin Bisenius		80525	The Ranch Master Plan (Reservoir Parks Master Plan)
Ralph Eberspacher		80525	The Ranch Master Plan (Reservoir Parks Master Plan)

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
GARY YORK	MY.STALLZ@GMAIL.COM	80538	The Ranch Master Plan Reservoir Parks Master Plan
Jason Gugelman	jgugelm@hotmail.com	80526	The Ranch Master Plan Reservoir Parks Master Plan
Brad Ells	mtnrunner43@Gmail.com	80524	The Ranch Master Plan Reservoir Parks Master Plan
STEVE JOHNSON	SCjmastertek@msn.com	80526	The Ranch Master Plan Reservoir Parks Master Plan
Steve Chaffee	chaffees3@yahoo.com	80524	The Ranch Master Plan Reservoir Parks Master Plan
John & MARY HOMAN	Jhoman@FRRI.com 2220 HAYMAKER LN	80521	The Ranch Master Plan Reservoir Parks Master Plan
Matt Hartwig			The Ranch Master Plan Reservoir Parks Master Plan
TIM LARSON	timplarson@gmail.com		The Ranch Master Plan Reservoir Parks Master Plan
Will Hickey	CSU-hickey@yahoo.com	80524	The Ranch Master Plan Reservoir Parks Master Plan
TODD THIBODEAUX	TODD.THIBODEAUX@[illegible].GOV	82001	The Ranch Master Plan Reservoir Parks Master Plan

SIGN UP FOR PROJECT UPDATES

Name	Email Address	Zip Code	Join Mailing List? (Circle one or both)
PETE SKRAM	PETE@PETERSKRAM.COM	80525	The Ranch Master Plan Reservoir Parks Master Plan
KENNY BEARDEN		80525	The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
			The Ranch Master Plan Reservoir Parks Master Plan
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