Chapter 5: McMillan Mesa Natural Area

5.1 Property Overview

The topography of McMillan Mesa was shaped by periods of tectonic scale geologic change in the western United States over the last 65 million years in north-central Arizona. Rapid uplift associated with the rise of the Colorado Plateau began around 5 million years ago and continues to occur. More recent and localized fracturing, faulting, and uplift is also likely related to volcanism in the surrounding San Francisco Volcanic Field. McMillan Mesa was formed when a vent near Woody Ridge erupted during a volcanic period about 6 million years ago. Thick basalt flows spread across surface outcrops of red Moenkopi sandstone, slowly eroding into the weathered malpais we see today.

Much of what is now McMillan Mesa was a component of US Forest Service holdings in the Flagstaff area. The City traded land in the Inner Basin of the San Francisco Peaks to the Forest Service for large parcels on McMillan Mesa and what is now Buffalo Park. The area is named after Thomas McMillan, one of the earliest Flagstaff area settlers, who owned land near what is now Cheshire and the Museum of Northern Arizona. He was a prominent citizen in the Flagstaff community and an early Coconino County Supervisor.

Community members and local organizations have advocated for preservation of the greater McMillan Mesa area for decades. Through the years, various agencies have proposed plans and concepts for the property, but there was not consensus about what the primary use of the property should be (e.g. active park land, passive open space, or other forms of development). These plans have ranged from building golf courses and other types of development, to preserving the entire property with a "do nothing" mentality.

The City Council adopted the McMillan Mesa Village Specific Plan in 1992 and the McMillan Mesa Master Plan in 2002. The Flagstaff 2030 Regional Plan acknowledged the ongoing community conversation regarding the conservation values of the Mesa and designated portions of the City parcels on the Mesa north of Forest Avenue as "Employment," southwest as "Future Suburban," and areas outside of Buffalo Park as "Area in White" – a designation that does not bind those parcels to any specific use.

On November 8, 2016, approximately 86% of Flagstaff voters voted in favor of Proposition 413 – Campaign for a Greater Buffalo Park. This proposition restricted the use of approximately 300 acres of City-owned property on McMillan Mesa to public open space and passive recreation (Initiative Number 2016-02). The results of the election were canvassed and approved by Resolution Number 2016-38 on November 28, 2016. The preservation of these lands was enacted through the voter initiative process and therefore, can only be amended by the City Council if the proposed amendment furthers the original purpose of Proposition 413. Any substantive changes that do not further the purpose would have to go back to the voters. This provides the highest level of protection available.

The land affected by Proposition 413 is currently zoned as Public Facilities and Rural Residential (as of March 2019), both of which permit "Outdoor Public Uses, General" and "Passive Recreation" as allowed uses (Zoning Code 10-40.30.030 and 10-40.30.060). Therefore, the City can plan and develop trails, trailheads, parking, and other amenities consistent with the initiative. According to the Ordinance, the City cannot sell the land or

permit any of the other allowed uses under Public Facilities and Rural Residential, and therefore it is protected as de facto conservation land given the development limitations.

Even though the current zoning allows for the passive recreation uses required by the proposition, the City Council directed staff to amend the Regional Plan and Zoning Code to reflect the outcomes of Proposition 413. The City Council approved the McMillan Mesa Natural Area major plan amendment (Resolution Number 2018-50) on Tuesday, October 16th, 2018. The resolution amended the Flagstaff Regional Plan 2030 by amending the Future Growth Illustration (Maps 21 and 22) and the Road Network Illustration (Map 25) to make the land use and road network designations consistent with the McMillan Mesa Natural Area. It also clarified the extent of surrounding land uses on City property, corrected mapping errors, and established an effective date. The resolution went into effective on November 15, 2018.

The 317.90 -acre McMillan Mesa Natural Area is primarily surrounded by private parcels, designated City-park land (McPherson Park and Buffalo Park), and other City-owned properties. Surrounding neighborhoods and parcels include to the west, Switzer Mesa, McMillan Mesa Village, Stone Ridge and Hospital Hill, to the north, the USGS and NACET Business Park, east are Shadow Mountain, Grandview Homes, and Sunnyside, and south lies the San Francisco de Asis Roman Catholic Parish property (Figure 1&2: Neighborhood maps near McMillan Mesa Natural Area). Subsequently, the expansive conservation land preserves “neighborwoods,” which are open spaces near residents’ homes where people may relax and enjoy a variety of outdoor activities, as defined by the Flagstaff Area Open Spaces and Greenways Plan in additional detail, Section 1, pages 21-22. The protected conservation land provides neighborwoods opportunities and serves as a natural environment buffer for the adjacent neighborhoods. Of the neighborhoods near McMillan Mesa, Sunnyside - Census Tract 3, is identified as Title VI, low-income area. Executive Order 12898 focuses attention on Title VI by providing that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Thus, the protection of McMillan Mesa is an important success in social justice, providing access to natural settings that help support better health, environment, and equitable access.

The preservation of the McMillan Mesa Natural Area is presented with a number of land management challenges. Population growth and related surrounding development creates the most immediate impacts. Arizona is the fourth fastest growing state in the U.S. based on projected percent change in population size from 1995 to 2025 (U.S. Census Bureau 2016a). The population estimate of Flagstaff was an approximated 70,320 in July 2015, with a 6.4% increase since April 2010 (U.S. Census Bureau 2016b). Population growth and development have greatly affected the Natural Area’s wildlife habitat, viewshed, night sky, sound pollution, vegetation, and the human experience. With growth, increased use impacts the fragile characteristics of the ecosystem, ecological succession and soil development.

Climate change creates another veritable administrative demand. Coconino County has been experiencing climate changes. Average temperatures have been rising, particularly in the last 30 years (Climate Profile, City of Flagstaff, 2018). The region is likely to see fewer cold days and more hot days in the coming decades. Annual average temperatures could rise even more than the global average–possibly more than 10° F higher than the long-term average in the region (Climate Profile, City of Flagstaff, 2018). Based on the examination of Flagstaff and Coconino County’s historic and projected climate, there is a clear warming trend. Although natural variability will always exist, meaning some years will be warmer and some colder, the overall trend is

toward warmer temperatures; in particular, low temperatures are not, and will not be, as low as in the past. Although there are no clear trends in precipitation, the warmer temperatures will contribute to an overall drying trend. The implications of these changes for Flagstaff have create vulnerabilities in maintaining ecosystems and are discussed in climate vulnerability assessment process.

McMillan Mesa Natural Area consists of portions of 5 separate parcels within sections 10, 11, 14, and 15:

- 107-01-001B: 152-acre parcel southeast of Gemini Drive and the “cinder pit” parcel.
- 101-28-007C: 19-acre parcel immediately north of the “Horseshoe Neighborhood”.
- 110-08-001G: the southwest portion of this parcel bounded by USGS facility, Switzer Canyon Trail, Forest Avenue, and North Turquoise Drive.
- 109-02-001S: the southern portion of this 107-acre parcel bounded by Forest Avenue, Coconino High School, the “cinder pit”, and the APS powerline.
- 107-01-001F: 2 acres, located southeast of Gemini drive.

Along with the 5 parcels indicated above the Regional Plan amendment included the following parcels as Parks/Conservation Land to be managed for the benefit of the community.

- 101-37-002J and 107-01-001G: City-owned parcels less than 0.09 acres in size, adjacent to 107-01-001F, which were not included in Proposition 413; however, the parcel is too small to be used for other purposes, unless combined with an adjacent parcel.

Figure 1: McMillan Mesa Natural Are Vicinity

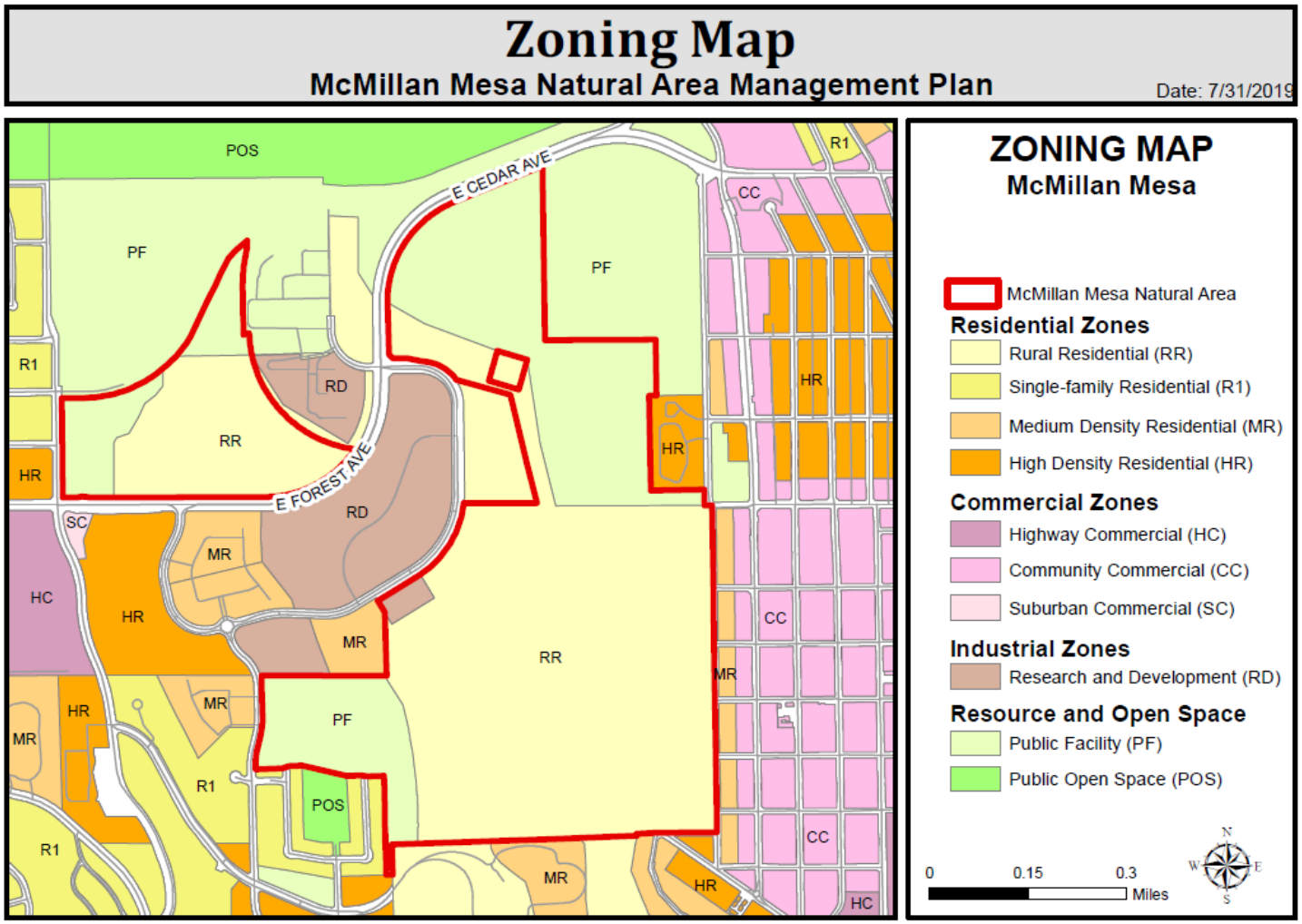

Figure 2: Zoning designations for McMillan Mesa Natural Area and the surrounding vicinity as of 2018.

5.2 Natural Resources

Central to the overall management of McMillan Mesa Natural Area is the effective management of its natural resources. The water, wildlife, vegetation and geologic resources are important factors that supported permanent preservation of the property, and subsequently need to be managed and maintained appropriately to ensure they are not damaged. To ensure the protection of the biological, physical, and visual resources, specific management goals, policies, and actions have been identified.

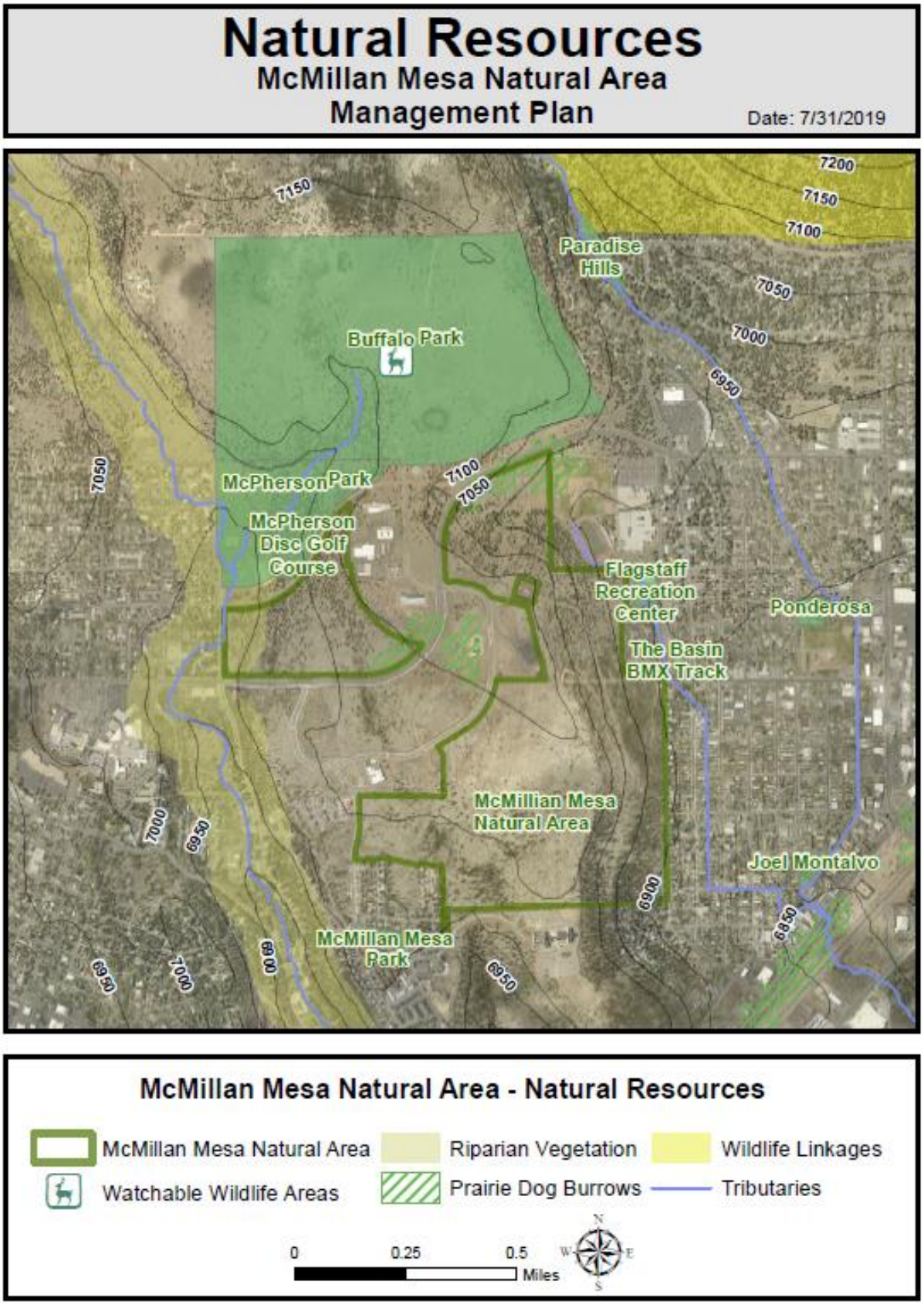

Figure 3: Significant Natural Resources: wildlife, vegetation, and hydrology.

5.2.1 Water Resources

Summary of Current Conditions:

McMillan Mesa Natural Area does not encompass significant above-ground water resources. The property has very little designated floodplain and/or floodway (Figure 4), which are designated waterways that are regulated by the federal government and have strict requirements associated with any type of development, including trail development. A recent well-siting study completed for the City in 2018 provided reconnaissance-level information regarding active recharge on the mesa itself. Geophysical survey results suggest that recharge is likely occurring on the flanks of the mesa, and not necessarily within the Natural Area parcels.

However, steep, forested slopes on the eastern edge of the Natural Area create opportunity for erosion as a result of runoff. This slope is soft and rain events often result in sediment and mud running off of the property. Drainage facilities at the bottom of the hill, west of Izabel Street, would capture and retain sediment, preventing it from flowing onto the street or adjacent FUTS trail.

Recent research on the North American Monsoon points to changes that may affect Coconino County and Flagstaff. Warmer temperatures have expanded and intensified the North American monsoon ridge, resulting in fewer storms across Arizona during the peak of the monsoon season (late-July to mid-August) (Climate Profile, City of Flagstaff, 2018). This generally has led to a decline in seasonal precipitation totals during the last 30 years (1980–2010) (Climate Profile, City of Flagstaff, 2018). Though there have been fewer storms, the most extreme storms have become more intense (as measured by amount of precipitation and wind gusts). This change could lead to increased erosion and potential flooding. Though designated floodplain are rare on the property, any shallow ephemeral wetlands, even localized spring snow-melt ponds are especially important in maintaining ecosystem health and biodiversity. These can support sedges, wildflowers, insects, and provide water for wildlife. They are a primary area for protection.

Management Goal: Similar to all legally designated open space, McMillan Mesa Natural Area will be managed to maintain or improve surface and ground water quality, surface water flow, ground water levels, and overall watershed health.

Management Policies: In addition to the general management policies guiding water resource management (outlined in Chapter 2.1.1), the following policies apply to the management of water resources within McMillan Mesa Natural Area:

- Manage forest resources related to water resources (e.g. intercepting precipitation, stabilizing soils, and minimizing erosion).
- Support the City Parks Section to investigate possible solutions and the feasibility of designing a project for preventing wildlife crossings on Forest/Cedar Avenue that are related to the maintenance or improvement of surface water features to the north of Cedar Avenue in Buffalo Park.

Planned Management Actions: In addition to the general management actions guiding water resource management (outlined in Chapter 2.1.1), the following actions are planned within McMillan Mesa Natural Area:

- Work with City Stormwater Section to determine the need for stormwater treatments at the north end of N Hemlock Way.
- Work with Flagstaff Urban Trails System staff to ensure continuous maintenance of the FUTS drainage control structures within the natural area.
- Work with partners to assess possibility of implementing a revegetation plan on the eastern edge of the Natural Area where runoff occurs. This slope is soft and rain events often result in sediment and mud running off of the property.
- Provide support to City Stormwater Section to determine the necessity and feasibility of constructing and maintaining a drainage basin near Izabel Street to capture and retain runoff from the slope.
- Provide support to Stormwater to assess the necessity and benefits of drainage facilities at the bottom of the hill, west of Izabel Street to capture and retain sediment, to prevent it from flowing onto the street or adjacent FUTS trail.

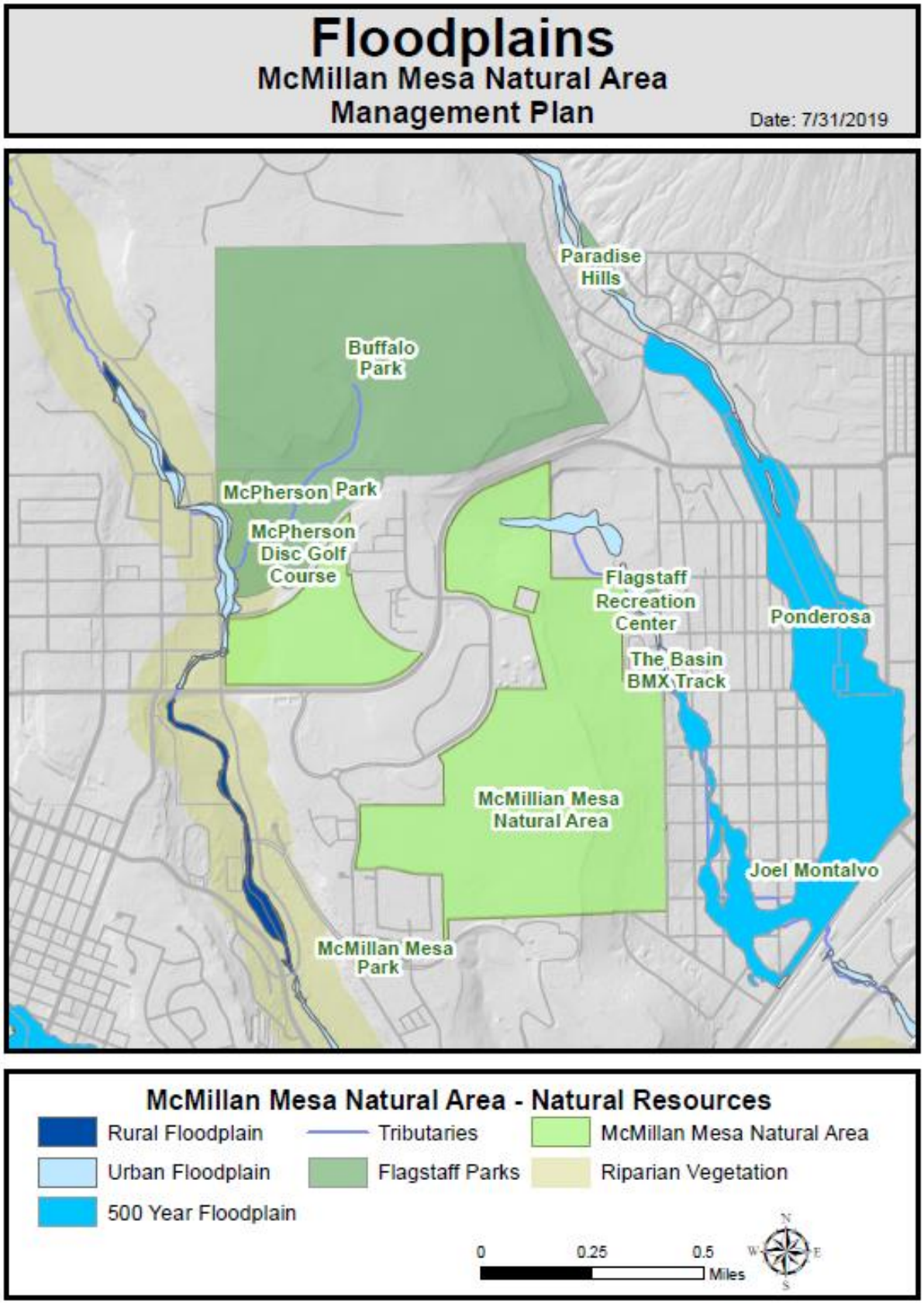

Figure 4: Designated floodplain within the vicinity of McMillan Mesa Natural Area.

5.2.2 Vegetative Resources

Summary of Current Conditions:

The 300-acre McMillan Mesa Natural Area, in conjunction with the adjacent 215-acre Buffalo Park, preserves one of the last intact native grasslands within the City. The primary vegetation type is Arizona fescue/mountain muhly and the associated habitat type is montane meadow grassland. There are small patches of overstory comprised of ponderosa pine (*Pinus ponderosa),* Gambel oak (*Quercus gambelii)*, and alligator juniper (*Juniperus deppeana)*, but a significant amount of the vegetative biodiversity exists as native grasses, shrubs, cacti, and wildflowers. Some of the primary species include: muttongrass (*Poa fendleriana)*, blue grama (*Bouteloua gracilis*), Arizona fescue (*Festuca arizonica)*, black dropseed (*Sporobolus interruptus)*, low rabbitbrush (*Chrysothamnus viscidiflorus)*, Wood's rose (*Rosa woodsii)*, wax currant (*Ribes cereum)*, Indian paintbrush (*Casteilleja spp.)*, buckwheat (*Fagopyrum esculentum)*, and common sunflower (*Helianthus annus)*. Grasses, forbs, and shrubs provide important forage, cover, fawning, and nesting sites for the wildlife that use the area, thus contributing to the wildlife habitat of the Natural Area.

Vegetation plays a key role in the stability of soils. Efforts to maintain native plant populations should be a priority. Some erosion may result from natural runoff, yet when plants are damaged or void from terrain erosion greatly increases. The Terrestrial Ecosystem Survey classifies the soils within the Natural Area as a combination of rocky basalt and black cinder. The rocky basalt ecosystem type is described as rocky basalt surface soils with loam surface soils and clay loam subsoils. The black cinder ecosystem type is described as a dry, nitrogen-poor, sand-gravel, volcanic cinder soil. Results from the Well Siting Study (2018) suggest that these soil types are wide-spread across the mesa with no evident areas where recharge of surface water to the C aquifer is occurring. The geophysical information suggests conductive material occurs within the upper 100 feet of land surface, which is likely clay, a mix of rock and clay, or the fine-grained Moenkopi Formation. Soil development is very slow in the arid environment, particularly the weathering of basaltic parent material on young landforms.

Soil stability is susceptible to land use patterns such as recreation. McMillan Mesa is likely more durable to some degree of recreational activity in comparison to younger volcanic features in the San Francisco Volcanic Field, although it's vulnerable to compaction, unauthorized trails, and erosion on slopes. Barren areas are anticipated to develop in heavily used areas from pedestrian activity. Unregulated recreation will exacerbate erosion and soil loss and increase the presence of invasive plants.

The rocky outcrops and escarpments within the Natural Area support a number of species that do not occur elsewhere, including: side-oats grama (*Bouteloua curtipendula)*, claret cup cactus (*Echinocereus triglochidiatus*), Apache plume (*Fallugia paradoxa),* mock pennyroyal (*Hedeoma oblongifolium),* pincushion cactus (*Mammilaria microcarpa)*, and Arizona grape (*Vitis arizonica)*.

There are also significant populations of invasive plants within the Natural Area. Invasive plants are aggressive spreaders and/or prolific reproducers, which can adapt to a variety of conditions and have few natural controls in their new habitat. The animals, birds, insects, and fungi that controlled them in their native habitat are absent. They are difficult to control or eliminate once established. Invasive plants currently found within McMillan Mesa include, Scotch thistle (*Onopordum acanthium)*, Diffuse knapweed (*Centaurea diffusa)*,

Dalmation toadflax (*Linaria dalmatica)*, and Cheatgrass (*Bromus tectorum)*. Additionally, squirreltail *(Elymus elymoides)* and western wheatgrass (*Pascopyrum smithii)* have become more prevalent within the Natural Area over the past decade. These are aggressive, invasive, drought-tolerant grasses with a strong potential to dominate the grassland ecosystem.

Invasive plant infestations reduce biodiversity by crowding out native vegetation, compete for resources, create monocultures, degrade wildlife habitat, and affect recreational use. Trails and other use impacts can result in the spread of invasive plants. Surveying the property for invasive plants and developing a Weed Management Plan are priorities. Special attention should be given to areas of disturbance.

Climate change can result in ecosystem transitions. Average temperatures in Coconino County have been rising since about the mid-1980s (Climate Profile, City of Flagstaff, 2018). Almost all years since 1985 have had average annual temperatures above the long-term average (Climate Profile, City of Flagstaff, 2018). Minimum temperatures, which manifest as days not being as cold and as fewer cold days per year, are largely driving the upward trend in temperatures. These trends are projected to continue into the future. Scenarios for Coconino County indicate that average temperatures could be 5° F above the current average (52.3° F) by 2050 and more than 10° F above the current average by the year 2100 (Climate Profile, City of Flagstaff, 2018). Climate trends are causing changes in vegetative cover. Invasive plants are spread in a variety of ways, but wind and the disturbance associated with adjacent development are the primary sources of invasive weeds on the Mesa.

The State of Arizona, U.S. Forest Service, and other land management organizations have identified multiple special status plant species within a 5-mile radius of McMillan Mesa Natural Area (Table 1).

Table 1: Special status plant species identified within a 5-mile radius of McMillan Mesa Natural Area.

Common Name	Latin name	Identification agency	Likelihood of occurrence	Notes
Schultz Rough Whitlow grass (rough draba)	Draba asprella var. stelligera	None	Low	The nearest collection is near NAU campus.
Flagstaff false pennyroyal	Hedeoma diffusa	USFS, State	Low	Needs limestone soil. The nearest locations are near Little America and NAU campus.
Hairy clematis	Clematis hirsutissima	USFS, State	Low	Rio de Flag (south of Little America) and an some old collections with labels saying “between Museum and Flagstaff.”
Mountain hollyfern	Polystichum scopulinum	None	Low	On Mt. Elden
Ebony spleenwort	Asplenium platyneuron	None	Low	No locations nearby
Rusby’s milkvetch	Astragalus rusbyi	USFS	Low	Endemic species limited to San Francisco Peaks volcanic field. Nearest locations near

				Museum of Northern AZ and Mt. Elden.
Fendler's sandwort	Eremogone fendleri	None	Unknown	Fairly common species with no special status. Collected on Observatory Mesa.
Northern maidenhair fern	Adiantum pedatum = A. aleuticum	None	Low	Nearest collection is Mt. Elden
Utah bladderfern	Cystopteris utahensis	None	Low	Mt. Elden
Mogollon columbine	Aquilegia desertorum	State	Low	Collections on Rio de Flag south of Little America) and on Mt. Elden
Green death camus	Zigadenus virescens	State	Low	No collections within 5 miles of site
Flagstaff beardtongue	Penstemon nudiflorus	USFS	Low	Possibly near Turquoise Drive.
Seashore cactus	Opuntia martiniana	None	Low	Not collected in our area.
Intermountain rubberweed	Hymenoxys helenioides	None	Low	Closest collection is in Hart Prairie area.

*None = no state or federal status.

Management Goal: McMillan Mesa Natural Area will be managed to maintain native plant communities present on the site by focusing efforts to control and/or reduce invasive species populations, as indicated in chapter 2.1.2.

Management Policies: In addition to the general management policies guiding vegetative resource management (outlined in Chapter 2.1.2), the following policies apply to the management of vegetative resources within McMillan Mesa Natural Area:

- Survey for sensitive plant species within the footprint of ground disturbing activities. If sensitive plant species are present, design projects to ensure these plants are protected.

Planned Management Actions: In addition to the general management actions planned for managing vegetative resources outlined in Chapter 2.1.2, the following actions are planned for McMillan Mesa Natural Area.

- Investigate the need to produce a self-guided brochure/native plant walk to introduce visitors to the native flora of the Mesa.
- Work with San Francisco Peak Weed Management Area to survey the property for invasive weeds and develop an Invasive Weed Management Plan specific for the property.
- Work to secure funding to manage non-native plant populations (e.g. Invasive Plant Grant from Arizona Department of Forestry and Fire Management).
- Coordinate with adjacent private landowners to treat any invasive weeds on their properties.
- Survey the property for rare and sensitive plant species to establish a baseline condition.

- Restore the vegetative community to support a balance of grasses to provide food and cover for wildlife such as ground nesting birds and prairie dogs throughout the year.

5.2.3 Forest and Grassland Health

Summary of Current Conditions:
The Natural Area consists primarily of a large open grassland. The City plans to protect this grassland from tree encroachment, which can affect water and nutrient cycling, impact soil integrity, and affect wildlife habitat.

The slope along the eastern edge of the parcel (dropping off into Coconino High School and Izabel Street) and the northwest portion of the Natural Area (between NACET/USGS and North Turquoise Drive) consists of overstory vegetation. The primary tree species include Gambel oak (*Quercus gambelii),* ponderosa pine (*Pinus ponderosa),* alligator juniper (*Juniperus deppeana)*. These trees provide cover for the elk, deer, and other mammals that use the area and habitat for nesting songbirds.

The Flagstaff Fire Department (FFD) is responsible for implementing any forest health improvement projects, monitoring local conditions and determining whether the City will implement fire restrictions, and responding to any fire activity within the property. The FFD has a policy to immediately suppress all wildfires and ignitions within City limits, which includes the Natural Area.

The FFD has conducted broadcast burning operations within the Natural Area in the past. The FFD also hand thinned the area during the mid-2000s to reduce small diameter trees and understory ladder fuels.

The Natural Area is bisected by several trails (see 6.4.2 Recreational Use). Trails can act as a firebreak, causing a gap in the vegetation to act as a barrier to slow or stop the progress of wildfire and could be used to hopefully reduce the size of a wildfire. General goals include maximizing the health of the Natural Area through implementation of thinning and broadcast burning operations. Properly maintained trails could be useful to conducting fire operations and could offset the cost of completing work.

Management Goal: Legally-designated open space will be actively managed to achieve forest and grassland structures that are resilient to wildfire and resistant to other disturbances, while continuing to provide ecosystem services to the surrounding community.

Management Policies: In addition to the general management policies guiding forest and grassland health management (outlined in Chapter 2.1.3), the following policies apply to the management of forest health resources within McMillan Mesa Natural Area:

- Protect the grassland from tree encroachment through hand thinning and/or broadcast burning.
- Work to plan and implement thinning and broadcast burning operations as the need arises, based on input and in partnership with the Flagstaff Fire Department.

Planned Management Actions: In addition to the general management actions planned for managing forest and grassland health (outlined in Chapter 2.1.3), the following actions are planned for McMillan Mesa Natural Area:

- Establish photo monitoring points to track forest and grassland structure over time, including the spread of alligator juniper through the area grassland.
- Investigate incorporating adjacent parcels of privately-deed restricted dedicated open space held (e.g. Area between N Manzanita Way and N Hemlock Way, parcel: 10128007F) into the McMillan Mesa Natural Area to improve management and maintenance of healthy grassland conditions.

5.2.4 Wildlife Resources

Summary of Current Conditions:
A variety of wildlife habitats within McMillan Mesa Natural Area and the adjacent Buffalo Park, support resident and migratory species. These habitats include grasslands, ephemeral wetlands (within Buffalo Park), ponderosa pine woodlands, and pine/oak woodlands, although the primary wildlife habitat is montane meadow grassland. This is an at-risk habitat type in the southwest region.

Wildlife is one of the features that draws public use of the area, which includes a resident herd of mule deer and flocks of mountain bluebirds. The Gambel oaks and wax currants also provide good habitat for skunks, foxes, porcupines inhabiting the area.

Although the Natural Area provides habitat for mule deer and other species of wildlife, Forest Avenue and expanding development to the south limit its utility as a wildlife corridor and pose a risk to wildlife trying to move through the area. Wildlife can become "bottlenecked" in the southern portions of the Natural Area without a clear path back to appropriate habitat.

Additionally, Forest/Cedar serves as an obstacle for wildlife seeking forage within the grassy meadows of the Natural Area. There have been multiple collisions between vehicles and deer along Cedar/Forest within the vicinity of McMillan Mesa Natural Area.

Rocky outcrops are fairly common in the Natural Area and provide unique cover and habitat for small mammals and reptiles. It is an important goal to minimize ground disturbance to these features, especially considering that they are specifically identified for their conservation value in the 2030 Regional Plan.

McMillan Mesa Natural Area is within Game Management Unit 11M. As of the 2018 Arizona Hunting Regulations, all hunting (including archery) is not permitted within McMillan Mesa Natural Area. This is due to its status as Municipal Park. The Arizona Game and Fish Commission has exempted some Municipal and County Parks from hunting because of the user conflicts that can arise (explanation in Arizona Game and Fish, pamphlet SB 1334). McMillan Mesa Natural Area is an example of a park where surrounding land ownership and current recreational use is not very compatible with hunting. However, the authority to regulate hunting lies solely with the Arizona Game and Fish Commission under ARS Title 17 (except for Tribal and National Park lands). Hunting Regulations are updated annually, including those for Unit 11M, by the Commission and they should be consulted to obtain the most updated regulations in future years. If hunting regulations were changed or McMillan Mesa was no longer identified as Municipal Park the prohibition of all forms of hunting within the McMillan Mesa Natural Area could change. Firearm use is not permitted within City Limits at any time.

There are not any known, systematic wildlife surveys within the Natural Area. A 2017 query of the

Environmental Review Tool (Arizona Game and Fish Department) revealed a number of federally listed or sensitive species that are documented to occur within a 5-mile radius of the Natural Area. These species may use the Natural Area at some point during their life cycle.

Table 2: Special status animal species identified within a 5-mile radius of McMillan Mesa Natural Area.

Common Name	**Latin Name**	**Identification Agency**	**Likelihood of Occurrence (per AZ Game and Fish Dept.)**
Greater short-horned lizard	*Phrynosoma hernandesi*	unknown	High
Allen's lappet-browed bat	*Idionycteris phyllotis*	FWS, USFS, BLM	Seasonal use possible
Bald eagle	*Haliaeetus leucocephalus*	FWS, USFS, BLM, State	Occasional use possible
Northern goshawk	*Accipiter gentilis*	FWS, USFS, BLM, State	High
Big brown bat	*eptesicus fuscus*	State	High
Many-lined skink	*plestiodon multivirgatus*	unknown	High
Peregrine falcon	*Falco peregrinus anatum*	FWS, USFS, BLM, State	Occasional use possible
Arizona myotis	*Myotis occultus*	FWS, BLM	Occasional use possible
Arizona (Mountain) treefrog	*hyla wrightorum*	State	Occasional use possible
Mexican Spotted Owl	*Strix occidentalis lucida*	FWS, State	Occasional use possible
Gunnison's Prairie Dog	*Cynomys gunnisoni*	USFS, State	Documented occupancy

Gunnison's Prairie Dog. There are multiple Gunnison's prairie dog (*Cynomys gunnisoni)* colonies and burrows within the Natural Area, suggesting a sizable population (Figure 9). Gunnison's prairie dog is native to the shortgrass and mid-grass prairies, grass-shrub habitats in low valleys, and subalpine mountain meadows of the Colorado Plateau. Gunnison's prairie dogs are considered to be a keystone species for grassland ecosystems in the Southwest. They create habitat, provide food, and help keep the soil and plant communities healthy. In addition, their burrowing helps to aerate the soil, add organic matter, and help to increase water penetration. The species has experienced significant habitat loss due to urban expansion, grassland conversion, and development. Additionally, prairie dog populations are susceptible to sylvatic plague, a flea-transmitted disease, which has had devastating mortality impacts on colonies throughout the region and can potentially result in the loss of the colony when it arises. The U.S. Fish and Wildlife Service was petitioned to list the Gunnison's Prairie Dog as an endangered or threatened species, under the Endangered Species Act, 16 U.S.C. § 1531 et Seq., and to designate critical habitat. A 12-month review, published by the Service in November of 2013, chose to state that listing either *C. g. gunnisoni* or *C. g.zuniensis* or both was not warranted at that time. The Arizona Game and Fish Department lists the Gunnison's prairie dog nongame mammal. Overall, due to the

sensitive nature of the species, and because threats against Gunnison's prairie dogs reverberate throughout the prairie dog ecosystem and greater environment, risks to the species need to be minimized.

American Kestrel. A resident population of American Kestrels (*Falco sparverius*) have been identified on the Mesa. Although the American Kestrel is relatively abundant in North America, count data from the USGS Breeding Bird Survey indicates that the North American breeding population is experiencing long-term, gradual, but sustained declines. Between 1966 and 2015 populations declined by about 50%. Current declines are related to continued clearing of land and the falling of the standing dead trees that birds depend on for nest sites. Nesting sites are further reduced by so-called "clean" farming practices, which remove hedgerows, trees, and brush from farmland. Pesticide use also affects kestrel survival rates. A larger problem with pesticides is that they destroy the insects, spiders, and other prey on which the birds depend. Exposure to pesticides and other pollutants can also reduce clutch sizes and hatching success. High levels of traffic disturbance and human development surrounding nesting sites are found to increase stress hormones that can lead to reproductive failure. Among successful nests, however, nestlings do not typically experience a higher stress response to environmental human disturbance, suggesting that they can tolerate some degree of human activity near the nest.

Management Goal: Legally-designated open space will be managed to maintain and enhance a diversity of habitats that support native wildlife species. Emphasis will be placed on the protection of rare habitat types and special-status species.

Management Policies: In addition to the general management policies guiding wildlife resource management (outlined in Chapter 2.1.4), the following policies apply to managing wildlife resources within McMillan Mesa Natural Area:

- Design infrastructure so that it does not fragment, or significantly alter wildlife habitat and movement (e.g. wildlife friendly fencing).
- Consider options to enhance wildlife habitat to protect native species especially special-status species with non-intrusive habitat improvement projects (e.g. nest platforms, and bat boxes).
- Minimize ground disturbance to rocky outcrops.
- Construct and maintain trail systems and infrastructure to minimize erosion and disturbance to sensitive wildlife.
- Take comment and work with the Conservation Study Forum, Arizona Game and Fish Department, and City Parks Section to come up with possible solutions to prevent wildlife crossings on Forest/Cedar Avenue.
- Prairie dog policies (survey and translocation requirements for large-scale ground disturbing activities)
    - Survey and map colonies on entire Natural Area in partnership with local organizations (e.g. Habitat Harmony).
    - Monitor the incidence of plague throughout the Natural Area.
        - When plague is detected, implement the following actions: 1) work with the Arizona Game and Fish Department to notify the public 2) increase monitoring effort to identify extent of outbreak 3) where and when appropriate and feasible, implement mitigation measures such as dusting burrows to kill fleas.

Planned Management Actions: In addition to the general management actions planned for managing wildlife resources (outlined in Chapter 2.1.4), the following actions are planned for McMillan Mesa Natural Area:

- Investigate installing infrastructure along Forest/Cedar Avenues to alert drivers when an elk is in the area (e.g. motion censored alert system that is triggered when a collared animal is in the area)
- Investigate installing additional signs along Forest/Cedar Avenues to minimize wildlife collisions in coordination with Arizona Game and Fish Department.
- Work with partners to maintain sensitive wildlife species.

5.3. Cultural and Historic Resources

Summary of Current Conditions:

There are multiple evidences of cultural and historic resources within, and surrounding McMillan Mesa Natural Area. Formal archaeological surveys have been completed within some of the Natural Area. One at the request of Design Master Homes, Inc. was completed on a 13-acre portion of Sec. 15, T21, R73, in August of 1976. In 1980, in preparation of the land exchange between the City and Coconino National Forest, another was preformed to ensure no effect to cultural resources. During the survey remnants of the Knob Hill Ranger Station was identified, and an archaeological site consisting of approximately 70 to 100 lithic flakes. Another survey, as part of the Gemini Parkway Study, was conducted by the Museum of Northern Arizona in October 1984, recording fifteen archaeological sites, ten prehistoric sites dating primarily to the early eleventh century and five historic sites that dated from the early 1930s to 1957.

These studies have uncovered multiple cultural resources, including petroglyph panels which may be of Cohonina or Northern Sinagua origin. There are also evidences of grinding slicks in the area around this petroglyph panel. Additionally, a lithic scatter of approximately 70-100 flakes was located in the area, but was deemed to be ineligible for the National Register of Historic Places by the Coconino National Forest and State Historic Preservation Office in 1981.

Additionally, the Beale Wagon Road (also known as the Beale Camel Road or 35th Parallel Route) travelled through the area. The 35th Parallel Route was surveyed in 1851 by Lorenzo Sitgreaves and company, for a wagon road; and again, by Amiel Weeks Whipple in 1853, this time for feasibility of a railroad. Edward Fitzgerald Beale and company were commissioned (famously using camels) by the government to physically build a wagon road along this route in 1857/1858. The Beale Wagon Road provided cross-country wagon travel along the 35th parallel as a means of connecting Fort Defiance in Ohio to the Mohave Trail in California. This was a primary access road until the 1880s, when the transcontinental railroad was built through northern Arizona, providing a better form of travel.

The wagon road often exists as an eroded trough across the land, cut by the hooves of thousands of animals and the iron-rimmed wheels of many wagons and stagecoaches. Portions of Cedar Avenue seem to follow the alignment of the Beale Wagon Road, and a portion of the Road travelled through the northern portion of the McMillan Mesa Natural Area that is west of NACET and USGS and east of McPherson Park.

The portion of the Beale Wagon Road through the Petrified Forest National Park was listed on the National Register of Historic Places in 1977 given its significance to discovery, settlement, and transportation. The

Coconino National Forest manages the roadway on their property as eligible for listing on the National Register of Historic Places.

A malpais/red sandstone quarry was located at the southern tip of McMillan Mesa. Although not located within the boundary of the Natural Area, the quarry provides historical context for the area and Flagstaff's history. This rock was used to build many of the historic structures in that area of town. Other quarries were located closer to downtown.

Management Goal: Legally-designated open space will be managed to preserve, protect, and interpret the cultural and historic resources present on the property.

Management Policies: In addition to the general management policies guiding cultural and historic resource management (outlined in Chapter 2.2), the following policies apply specifically to managing cultural and historic resources within McMillan Mesa Natural Area:

- Identify cultural resources to ensure no facility and/or improvements come in conflict with the preservation of resources.

Planned Management Actions: In addition to the general management actions planned for managing cultural and historic resources (outlined in Chapter 2.2), the following actions are planned for McMillan Mesa Natural Area:

- Complete a cultural survey of the Natural Area to identify cultural resource locations.
- Consider developing interpretive materials for the Beale Wagon Road, Knob Hill Ranger Station, Forest Service land exchange, etc.

5.4 Public Use

McMillan Mesa Natural Area is open year-round to varying levels of public use. The Natural Area is managed to provide passive outdoor recreational and educational opportunities, including hiking, snow shoeing, wildlife watching, and nature study/environmental education, in addition to others. Though the Natural Area is closed to overnight camping, star gazing and night walking are permitted. Motorized travel is prohibited within the property in order to protect the unique conservation values, except on official designated streets.

The Open Space Program believes that research and education are important uses of legally-designated open space. If interested in using McMillan Mesa as a test site for a research project or other educational program or project, please contact the Open Space Program at NaturalAreas@flagstaffaz.gov.

Table 3: Permitted and Prohibited Recreational Uses of McMillan Mesa Natural Area

Permitted Uses	Prohibited Uses
Cross Country Skiing	Campfires
Geocaching	Camping
Hiking/Running	Fuelwood collection (except with permit)
Snow Shoeing	Off highway vehicles/driving
Mountain Biking	Hunting
Nature Study/Environmental Education	Firearm use

Wildlife Watching	Flying model aircraft, such as drones, airplanes, or rockets. (except with permit)
Stargazing	Large-scale activities/events (except with express written approval from the Open Space Specialist)
	Horseback riding

This chapter outlines the management goal, policies, and actions identified for managing public access, recreational use, roads, easements and leases, education and research, and facilities within legally-designated open space.

5.4.1 Access Management

Summary of Current Conditions:

There are significant opportunities for non-motorized access to McMillan Mesa Natural Area via FUTS trails from surrounding neighborhoods, including Switzer Ridge/Mesa, McMillan Mesa Village, and Sunnyside. Many of these trails traverse the Natural Area, cross Forest/Cedar Avenue, and continue into Buffalo Park.

There are a number of roads that provide motorized access adjacent to the Natural Area, including Gemini Road, Forest Avenue, Cedar Avenue, and Pine Cliff Drive. However, the only existing designated public parking area is located at the entrance to Buffalo Park on Gemini Road. Currently, the Buffalo Park parking area has approximately 45 parking spaces, year-round bathroom facilities, and water during seasonal allowance. The parking area is managed and maintained by the Parks Department.

Public transportation to the Natural Area exists via NAIPTAs Blue Line. As of December 2018, NAIPTA operates six bus stops along Forest/Cedar Avenue and Gemini Road to provide access for individuals wanting to visit McMillan Mesa Natural Area.

Management Goal: Legally-designated open space will be managed to ensure reasonable public access for non-motorized recreational activities.

Management Policies: In addition to the general policies guiding public access to legally-designated open space (outlined in Chapter 2.3.1.), the following policies apply to managing public access to McMillan Mesa Natural Area.

- Consider impacts associated with neighborhood versus public access when planning access points for the Natural Area.
- Utilize FUTS trails and other ROWs to access and complete administrative tasks (e.g. maintaining recreational and utility infrastructure).
- Limit motorized access to administrative activities.

Planned Management Actions: In addition to the general management actions planned for managing public access to legally-designated open space (outlined in Chapter 2.3.1), the following actions are planned for McMillan Mesa Natural Area.

- Work with Parks to investigate the possibilities of maintaining and/or improving the Buffalo Park parking lot to accommodate users of both Buffalo Park and McMillan Mesa.
- Investigate opportunities to create parking between the Arizona Trail bridge and N Gemini Road, north of E Forest/E Cedar Avenue (part of parcel: 11008001G).
- Investigate the potential of constructing an additional pedestrian bridge across Forest Avenue near Turquoise Drive to connect the north side of Forest Avenue (Buffalo Park/McPherson Park) to McMillan Mesa Natural Area. This would create a number of loop trail opportunities, enhancing opportunities for running and biking events (e.g. 3K, 5K, 10K loops). While this recommendation is not presently included in the current FUTS Master Plan, it will be incorporated into future FUTS Master Plans for consideration.
- Finalize Beale Trail alignment to enhance non-motorized access from the northwest, as outlined in the FUTS Master Plan.
- Investigate opportunities to work with FUTS to achieve accessible and/or ADA compliant access and trails.
- Evaluate unauthorized access points from Izabel St and determine management direction.
- Investigate opportunities with adjacent landowners (e.g. BASIS, San Francisco de Asis Catholic Church, NACET, USGS) to provide public parking for the Natural Area, possibly via formalizing one of the informal parking areas that exist at the end of N Manzanita Way or N Hemlock Way in close coordination and partnership with the local neighborhood.
- Work with BASIS to discourage parking at N Manzanita Way and N Hemlock Way that is not related to the use of the natural area.

5.4.2 Recreational Use

Summary of Current Conditions:

The Natural Area receives a significant amount of public use from Flagstaff residents and visitors. Trails from surrounding neighborhoods and additional access allows visitors to participate in activities including, hiking, jogging, bike riding, cross-country skiing, snow-shoeing, and wildlife watching (Table 2 -- Permitted and Prohibited Recreational Uses of McMillan Mesa Natural Area). The Natural Area, combined with the adjacent Buffalo Park, provides visitors a sense of peace and quiet within the City center.

One of the two primary goals of the Campaign for a Greater Buffalo Park effort was preserving opportunities to recreate within the urban environment and establish a buffer of natural communities for adjacent neighborhoods. The Open Spaces and Greenways Plan define this type of space as, “Neighborwoods”. These are open spaces near residents’ homes which provide easily accessible places where people can remove themselves from urban environments to relax, enjoy a variety of outdoor activities, and spend time alone or with family and friends. These places have trees, grasses, and rolling landforms that improve the beauty of developed areas by softening urban edges and adding natural features. People using Neighborwoods can feel that they are in the woods, because they see forest vegetation and see and hear wildlife, without leaving the community. Neighborwoods help maintain the character of the Flagstaff community.

The second primary goal of the Campaign for a Greater Buffalo Park effort was preserving the expansive viewsheds of the San Francisco Peaks. Views of the peaks and other visually prominent features express the

true nature of the city. These 'mountain town' views are important in maintaining the character of the city, create a health environment to spend time in, and stimulate communities economic wellbeing.

Prior to the Natural Area's preservation most use occurred here by default rather than under planned management. With increasing numbers of people using the Neighborwoods a more managed condition is necessary. Increased neighborhood involvement and stewardship can help create and maintain the natural character and facilities of this category.

Population growth, development, and use have affected the Natural Area's wildlife habitat, viewshed, night sky, sound pollution, vegetation, and human experience. Furthermore, studies have shown that natural resources rely upon the larger, surrounding area to support their life cycles and most parks and natural areas are not large enough to encompass self-contained ecosystems for the resources found within their boundaries. This is especially true for the McMillan Mesa Natural Area as it is surrounded by urban development.

Existing Trails:

- ***Arrowhead Trail*** **-** This trail is included in the Adopt-A-FUTS program, which allows community groups and individuals to adopt a trail section by committing to perform 3 cleanups per year. The Adopt-A-FUTS program is managed by the Community Stewards program within the Sustainability Section of the City.
- ***Arizona Trail*** **-** A portion of the 800-mile trail that traverses from the Mexico to Utah borders is located on the property. A 30-foot-wide trail easement was established with neighboring landowners, including the San Francisco De Asis Roman Catholic Parish. The Flagstaff passage runs north and south through the middle of Flagstaff, starting south of town and traveling over McMillan Mesa and through Buffalo Park. This section of the Arizona Trail is a maintained walking trail with an improved surface of mostly gravel. The trail is for public access, including hikers and bicyclists, and is included in the FUTS system. The trail is maintained by the City Parks Department and Arizona Trail Stewards. Any modifications to the Arizona Trail requires coordination with the Arizona Trail Association and FUTS staff.
- ***Cedar Trail*** **-** A pedestrian/commuter trail that is parallel to Cedar Avenue but buffered from the road by a band of "open space". It crosses over McMillan Mesa along the south side of Cedar and Forest Avenues from Turquoise Drive to West Street. Going over the Mesa means there are steady and at times very steep climbs from both ends of the trail. Approximately half of the trail is concrete (the portion west of pedestrian bridge), while the other half is constructed with an aggregate material (the portion east of pedestrian bridge). The trail is part of the Flagstaff Urban Trail System (FUTS) and is maintained by the City Parks Department. FUTS trails are non-motorized, shared-use pathways utilized by bicyclists, walkers, hikers, and runners for recreation and transportation. This trail is included in the Adopt-A-FUTS program, which allows community groups and individuals to adopt a trail section by committing to perform 3 cleanups per year. The Adopt-A-FUTS program is managed by the Community Stewards program within the Sustainability Section of the City.
- ***McMillan Mesa Trail*** **-** A recreational FUTS trail traveling east-west across McMillan Mesa Natural Area, connecting the Sunset Trail just west of the Natural Area to the Arizona Trail within the eastern portion of the Natural Area. Given that the trail is part of the FUTS system, it is maintained by the City Parks Department. FUTS trails are non-motorized, shared-use pathways utilized by bicyclists, walkers, hikers, and runners for recreation and transportation. This trail is included in the Adopt-A-FUTS

program, which allows community groups and individuals to adopt a trail section by committing to perform 3 cleanups per year. The Adopt-A-FUTS program is managed by the Community Stewards program within the Sustainability Section of the City.

- ***Mesa Ridge Trail*** **-** A recreational 0.3-mile recreational FUTS trail connecting Cedar Trail to McMillan Mesa Trail. The trail is constructed with aggregate material and is relatively flat with very little elevation change. Given that the trail is part of the FUTS system, it is maintained by the City Parks Department. FUTS trails are non-motorized, shared-use pathways utilized by bicyclists, walkers, hikers, and runners for recreation and transportation. This trail is included in the Adopt-A-FUTS program, which allows community groups and individuals to adopt a trail section by committing to perform 3 cleanups per year. The Adopt-A-FUTS program is managed by the Community Stewards program within the Sustainability Section of the City.
- ***Sego Lily Trail*** **-** This unpaved, 0.64-mile trail climbs the east slope of McMillan Mesa, and provides access to open space between Izabel St/Sixth Ave and the Arizona Trail. It is especially important to providing access for the Sunnyside neighborhood. This trail is included in the Adopt-A-FUTS program, which allows community groups and individuals to adopt a trail section by committing to perform 3 cleanups per year. The Adopt-A-FUTS program is managed by the Community Stewards program within the Sustainability Section of the City.
- ***Sunset Trail*** **-** A connector trail along the top of the cliff at the west edge of McMillan Mesa. There may be a future opportunity to bridge Cedar Avenue to continue the trail north to the Switzer Canyon Trail. The existing portion is 0.60 miles, with 0.14 miles planned, for a total length of 0.74 miles.
- ***Switzer Canyon Trail*** **-** A recreational FUTS trail located on an old road bed that was the previous alignment for Cedar Avenue. When Forest Avenue was built over McMillan Mesa, this section of Cedar Avenue was abandoned and converted into a trail. When complete, this trail will allow users to travel from downtown Flagstaff to Buffalo Park while crossing only two major streets. The portion of Switzer Canyon Trail north of Forest Avenue is an aggregate-surfaced trail, while the portion of the trail south of Forest Avenue is concrete. Construction of the missing segment, which is outside the boundary of McMillan Mesa Natural Area, from Terrace Avenue to Switzer Canyon Road, is anticipated in 2019. Given that the trail is part of the FUTS system, it is maintained by the City Parks Department. FUTS trails are non-motorized, shared-use pathways utilized by bicyclists, walkers, hikers, and runners for recreation and transportation. This trail is included in the Adopt-A-FUTS program, which allows community groups and individuals to adopt a trail section by committing to perform 3 cleanups per year. The Adopt-A-FUTS program is managed by the Community Stewards program within the Sustainability Section of the City.

The Flagstaff Urban Trails System's master plan can be viewed at:
https://flagstaff.maps.arcgis.com/apps/MapJournal/index.html?appid=89039c5951ef48079218d8d46de3d4fb

Planned Trails:

- ***Quarry Trail*** **-** This trail will follow the forest hillside on the southwest corner of McMillan Mesa, from the Arizona Trail to the Switzer Canyon Trail. Upon completion, total length will be 0.85 miles. The east end of the trail overlooks an historic quarry, which is the source of the iconic red Moenkopi sandstone used in numerous buildings in Flagstaff and elsewhere.

The following forms of recreational use are incompatible with resource preservation goals of the McMillan Mesa Natural Area. Though equestrian use is permitted within the general legally designated open space

policies (Except on FUTS trails), the McMillan Mesa is surrounded by development and does not have adequate access for horses. The majority of the trails within the Natural Area are part of the Flagstaff Urban Trail System on which equestrian traffic is prohibited. A portion of the FUTS, designated as the Arizona Trail, passes through the Natural Area. Since horses are not allowed on FUTS this section of the Arizona Trail is not open for equestrian traffic; however, the Arizona Trail bypass, around the east end of town, is open to equestrian users. Mountain biking on trails is permitted in the Natural Area; however, Downhill biking, a genre of mountain biking practiced on steep, rough terrain that often features off trail travel, jumps, drops, boulder hopping, and other obstacles is prohibited. Flying model aircraft, such as drones, airplanes, or rockets is prohibited within the Natural Area except with permit, per 8-11-001-0008.

Management Goal: Legally-designated open space will be managed to provide a wide variety of developed and dispersed day-use recreational opportunities.

Management Policies: In addition to the general policies guiding recreational use of legally-designated open space (outlined in Chapter 2.3.2.), the following policies apply to managing recreational use of McMillan Mesa Natural Area.

- Limit developed recreation opportunities to preserve the scenic resources.
- Provide accessible recreational opportunities within current trails.
- Manage dispersed recreation to minimize soil compaction and impacts to wildlife forage.

Planned Management Actions: In addition to the general management actions planned for managing recreational use of legally-designated open space (outlined in Chapter 2.3.2), the following actions are planned for McMillan Mesa Natural Area:

- Investigate options to realign the steep section of the Cedar Trail to enhance public safety.
- Calculate existing unauthorized trail alignments for inclusion/exclusion in the trail system as connector trails to the existing FUTS network.
- Investigate need for design and installation of interpretive signs throughout the Natural Area describing the ecological importance of grasslands and forest succession of the Natural Area.
- Design and construct ADA compliant trails within the Natural Area.

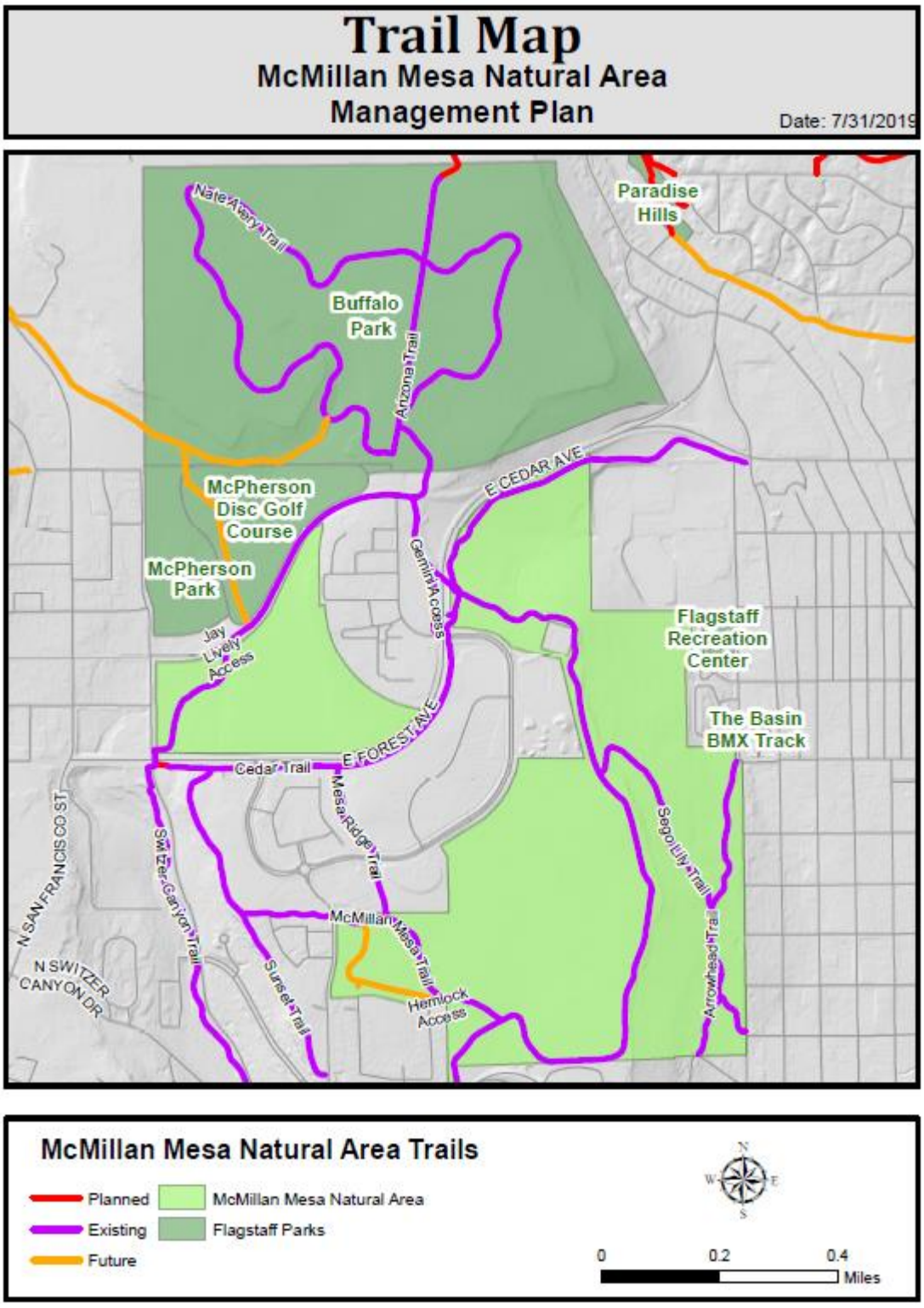

Figure 10: Existing and Planned Trails within the Vicinity of McMillan Mesa Natural Area.

5.4.3 Roads

Summary of Current Conditions:

McMillan Mesa Natural Area is a roadless property. There are multiple roadways surrounding the property and within the vicinity including: Forest Avenue, Cedar Avenue, Turquoise Drive, Pine Cliff Drive, Gemini Drive, Izabel Street, Apple Way, Hemlock Way, and Manzanita Way. All of these streets are managed and maintained by the City of Flagstaff Streets Department.

The Natural Area is a non-motorized recreational area. The City and its contractors are able to use FUTS trail alignments and other ROWs for motorized access throughout the Natural Area for administrative purposes (e.g. maintaining infrastructure).

Management Goal: Legally-designated open space will be managed to reduce motorized travel within these properties.

Management Policies: In addition to the general policies guiding road management in Chapter 2.3.3, the following policies apply to the management of roads within the vicinity of McMillan Mesa Natural Area:

- Investigate additional signage along Cedar Avenue and Forest Avenue alerting drivers about the wildlife in the area.
- Utilize FUTS trails and other ROWs to access and complete administrative tasks (e.g. maintaining recreational and utility infrastructure).
- Roads already developed for utility access should be managed to minimize disturbance to native vegetation and prevent the spread of invasive plants.
- Roads no longer needed should be decommissioned and restored when appropriate.

Planned Management Actions: In addition to the general management actions planned for managing roads outlined in Chapter 2.3.3, the following policies apply to the management of roads within the vicinity of McMillan Mesa Natural Area:

- Consider installation of boundary signs in appropriate areas to educate the public about the non-motorized regulations.
- Work with APS to restore soil and vegetation surrounding their parcel.

5.4.4 Easements and Leases

Summary of Current Conditions:

There are existing easements within and adjacent to the Natural Area, as well as utilities that cross the Natural Area that do not have easements. Many easements are under current roads. Given the amount of private and residential development surrounding the Natural Area, existing infrastructure are primarily for utilities and water infrastructure (including water lines and water valves), which the City of Flagstaff holds rights to.

Existing waterlines that run through the McMillan Mesa Natural Area will need to be accessed for work. City Water Services will work with Open Space to ensure that Natural Area is properly managed and restored to open space standards in the event of any impacts. Per City of Flagstaff engineering standards and city code no

infrastructure (buildings, bathrooms, fences, walls, etc.) can be built on top of or within 10 feet of a public water main.

Given that this property has been under City ownership since trading for it in 1959 from the National Forest Service there may be utilities crossing the property that do not have easements, as it would have been unnecessary for the City to obtain an easement from itself at the time. All existing utilities are required to be managed to prevent or minimize impacts and to fully restore any effects from operations. This requires the use of appropriate tools and the development of management strategies to limit impacts and restore impacts to Open Space standards.

In 1969, the City established a scenic easement over much of the greater McMillan Mesa area to protect the natural features of the property (Ordinance 744, 1969). This easement covered a majority of the Natural Area boundary, including Buffalo Park and much of the private property to the southwest. The scenic easement was abandoned in 1992 through Ordinance 1783. The next iteration of this type of protection is the Specific McMillan Mesa Area Plan (https://www.flagstaff.az.gov/1344/Completed-Area-Plans), which set height restrictions specific for every Tract, including a 45 foot maximum building height.

Future development on private parcels on McMillan Mesa (outside of the Natural Area boundary) will tie in with existing water utility infrastructure. The City does not anticipate needing to construct or install additional water lines in the area but does need to ensure access for maintenance of existing infrastructure.

When the veteran facility is constructed it will be necessary for the City to investigate alternatives to complete the project without ground disturbance in the protected Natural Area. Additionally, there is a planned gravity sewer line in which one of the proposed alternatives could cross through the northwestern section of the Natural Area. Alternative solutions will need to be considered by the City to prevent impacts to the Natural Area.

To meet future access needs Open Space will encourage all easement access through any existing easements. New easement requests, including access to existing utilities that do not have easements, will be reviewed by Open Space staff and if found appropriate will be forwarded to the Flagstaff City Council for approval and adoption of the appropriate ordinance. This includes all projects not directly related to the management of the Natural Area. Furthermore, any projects approved that could alter the McMillan Mesa Natural Area will need to provide solutions that restore the property to an improved condition. Projects directly related to the administration of the Natural Area, such as facility improvements or resource management, will be reviewed by Open Space staff. If the task is found appropriate for the management of the property, a project plan addressing potential and unintended changes to ensure the property is fully restored at the completion of the project, must be finished before implementation can occur.

Management Goal: Manage legally-designated open space for non-consumptive, sustainable uses.

Management Policies: In addition to the general policies applicable to managing easements and leases in Chapter 2.3.4, the following policies apply to managing easements and leases within McMillan Mesa Natural Area:

- City Water Services Department are to retain access to their easement areas for maintenance and improvements to their water infrastructure.

- Encourage future utilities to be below ground to protect the scenic values of the property, while minimizing other impacts. This requires the use of appropriate tools and the development of management strategies to limit impacts and restore the area to Open Space standards, in many circumstances requiring multi-year commitments.
- Use existing easements and reservations to the extent practical.
- Address new and existing utilities to prevent or minimize visual impacts, noise pollution, light pollution, ground disturbance, vegetation disturbance, interference with wildlife, conflicts with approved recreation, and other environmental impacts.

Planned Management Actions: In addition to the general management actions planned for managing easements and leases in Chapter 2.3.4, the following actions are planned for McMillan Mesa Natural Area:

- Ensure that ground-disturbing activities associated with easements and leases are coordinated with the Open Space Program to preserve resources and improve the condition of the Natural Area.

5.4.5 Education and Research

Summary of Current Conditions:

The abundance of educational opportunities in the immediate area is a testament to the educational and research opportunities available within the McMillan Mesa Natural Area. Since 1990 the Flagstaff Festival of Science has worked to connect and inspire the citizens of Northern Arizona, with the wonders of science and the joy of scientific discovery. In partnership, the City of Flagstaff utilizes Buffalo Park as an outdoor classroom, using the space to host astronomy programs and night sky viewings. Throughout the year, a number of additional events are hosted in the area including, Lights Out Flagstaff and Arizona Trail Days.

McMillan Mesa's preservation is an important contribution to education. Development, agriculture, and other land use practices have taken a heavy toll on grasslands, fragmenting them into isolated islands and reducing their extent. Noss et al. (1995), who reviewed and summarized estimated habitat loss, degradation, and fragmentation in natural ecosystems across the United States, classified grasslands and shrublands as "critically endangered ecosystems"—ecosystems which have declined by more than 98%. The Nature Conservancy estimates that shrub encroachment has affected over 35,200 km^2 (8.7 million acres) of grasslands nationwide.

McMillan Mesa's urban location and proximity to educational institutions make it a good fit for the biological studies of species, environmental investigations, and opportunities to visit the property to learn about land management and urban planning. Coconino High School is within close proximity to the northeast, BASIS Flagstaff Charter School to the east, and the Montessori Charter School of Flagstaff to the south. Also, within walking distance is the Peak School, Killip Elementary School, and Pine Forest Charter School.

Individuals and organizations wishing to complete research and/or monitoring projects on McMillan Mesa are required to complete an "Open Space Research Permit" application for the Open Space Program to review (Appendix H). Research projects are acceptable uses of McMillan Mesa Natural Area as long as they are non-destructive in nature and don't conflict with the conservation values or management goals or objectives for the property.

Management Goal: Legally-designated open space properties will be managed to provide diverse educational and research opportunities.

Management Policies: Policies applicable to managing education and research opportunities within McMillan Mesa Natural Area are outlined in Chapter 2.3.5.

Planned Management Actions: In addition to the general management actions planned for managing education and research in Chapter 2.3.5, the following actions are planned for managing education and research within McMillan Mesa Natural Area:

- Collaborate with adjacent schools (Coconino High School, BASIS Flagstaff Charter School, Montessori Charter School of Flagstaff) to use the Natural Area as an outdoor classroom for their students.

5.4.6 Facility Development

Summary of Current Conditions:

Because of the fragile characteristics of soil, the construction of facilities can have a negative impact on ecological succession, native plant populations, and soil retention and development. Facility development should avoid construction on steep terrain and ecologically sensitive areas. Locations with well-established native plant populations should be avoided for facility and infrastructure development, as they stabilize the soil and form organic matter important as soil nutrients. Facilities result in greater soil compaction and reduced water infiltration, while persistent foot traffic along steep slopes can exacerbate erosion rates.

McMillan Mesa is important for dark night sky preservation. The City was recognized as the world's first International Dark Sky City on October 24, 2001, for its pioneering work in the development and implementation of lighting codes that balance the need to preserve Flagstaff's dark sky resource with the need for safe lighting practices. The purpose of this division is to help assure that dark skies remain a resource to be enjoyed by the Flagstaff community and its visitors, and to provide safe and efficient outdoor lighting regulations that protect Flagstaff's dark skies from careless and wasteful lighting practices. Dark starry nights, like natural landscapes, forests, clean water, wildlife, and clear unpolluted air, are valued in many ways by the residents of this community, and they provide the natural resource upon which our world-renowned astronomical industry depends. Any facilities developed in the Natural Area need to be aligned with night sky City code 10.50.70.

Current facilities within McMillan Mesa Natural Area are primarily focused on the extensive FUTS trail network within the area, including trail signs and other trail-related infrastructure (e.g. trash cans, benches). During the McMillan Mesa usage survey Open Space received over 400 responses. Overall most people indicated that they prefer developments/improvements be minimized and that the property be kept as natural as possible. The majority of responses indicated that infrastructure such as signage, trails, parking and restrooms be minimal, and that emphasis be place on maintaining the health and preservation of the ecosystem.

Management Goal: Legally-designated open space will be managed to provide facilities that enhance visitor's experience.

Management Policies: In addition to the general policies applicable to developing facilities in Chapter 2.3.6, the following policies apply to developing facilities within McMillan Mesa Natural Area:

- Focus and cluster facilities to areas that are already developed (e.g. along Gemini, near Apple, by USGS) to reduce impacts to the interior portion of the Mesa.
- Design facilities with colors and materials that blend in with the landscape.

Planned Management Actions: In addition to the general management actions planned for developing facilities in Chapter 2.3.6, the following actions are planned for developing facilities within McMillan Mesa Natural Area:

- Where needed design and install minimal signage, such as boundary signs, regulatory signage, trail signs, directional signs, orientation kiosks, and interpretive signs for key locations in the Natural Area.
- Investigate the need for benches throughout the Natural Area to encourage passive use of the property.
- Investigate opportunities to work with FUTS to improve some trails to achieve accessible compliant access and trails.
- Investigate need for recycling and trash facilities and opportunities to partner with Parks to provide at the primary trailhead.
- Investigate need for bathroom facilities and opportunities to partner with Parks to provide portable toilets.
- Investigate providing equitable access:
    - Work with Parks to investigate possibilities to provide and maintain some parking at the Buffalo Park parking lot to accommodate users of both Buffalo Park and McMillan Mesa.
    - Investigate opportunities to create parking between the Arizona Trail bridge and N Gemini Road, north of E Forest/E Cedar Avenue (part of parcel: 11008001G).
    - Investigate opportunities with adjacent landowners (e.g. BASIS, San Francisco de Asis Catholic Church, NACET, USGS) to provide public parking for the Natural Area, possibly via formalizing one of the Informal parking areas that exist at the end of N Manzanita Way or N Hemlock Way in close coordination and partnership with the local neighborhood.
- Investigate the potential of constructing an additional pedestrian bridge across Forest Avenue near Turquoise Drive to connect the north side of Forest Avenue (Buffalo Park/McPherson Park) to McMillan Mesa Natural Area. This would create a number of loop trail opportunities, enhancing opportunities for running and biking events (e.g. 3K, 5K, 10K loops). While this recommendation is not presently included in the current FUTS Master Plan, it will be incorporated into future FUTS Master Plans for consideration.

5.5 Priority Action Plan

Table 4: Priority Action Plan – Facility Development

Action:	**Responsibility:**	**Potential Implementation Date:**	**Estimated Financial Requirement:**
Decommission and revegetate unauthorized trails and roads not designated as part of planned trail system.	City of Flagstaff	Summer 2020	$10,000

Investigate opportunity to install a welcome sign on Arizona Trail bridge.	City of Flagstaff	Summer 2020	$5,000
Work with FUTS to complete the trail plan.	City of Flagstaff	Summer 2021	$10,000
Investigate better connectivity of trails between Buffalo Park and McMillan Mesa.	City of Flagstaff	Summer 2021	$5,000
Design and install map dispersal stations at orientation kiosks	City of Flagstaff	Summer 2021	$7,000
Utilize volunteers and partner organizations to complete area monitoring and trail maintenance.	City of Flagstaff	on-going/monthly	$0
Install minimal interpretive signage in key locations.	City of Flagstaff	Summer 2021	$5,000
Install minimal orientation kiosks in key locations.	City of Flagstaff	Summer 2021	$5,000
Install minimal trail orientation signage.	City of Flagstaff	Spring 2020	$1,000
Investigate potential partnering opportunities to provide some parking access.	City of Flagstaff	Summer 2020	$50,000
Investigate partnership with Parks to maintain trash and recycling receptacles at primary trailhead.	City of Flagstaff	on-going/monthly	$5,000
Investigate potential partnership with Parks to install “pit” toilets at primary trailhead.	City of Flagstaff	Summer 2021	$100,000
Install dog waste bag dispenser at primary access points.	City of Flagstaff	Summer 2020	$2,000

Table 5: Priority Action Plan – Resource Management

Action:	**Responsibility:**	**Potential Implementation Date:**	**Estimated Financial Requirement:**
Conduct noxious plant surveys and maintain map of occurrence locations.	City of Flagstaff and volunteers	On-going	$3,000 per annum
Coordinate with Flagstaff Fire Department and Arizona State Forestry to complete forest health improvement projects.	City of Flagstaff	Variable	$0
Treat invasive weeds biannually.	City of Flagstaff	Bi-Annually	$3,000 per annum
Establish cultural resource baseline documentation.	City of Flagstaff, with volunteers	Winter 2019	Unknown
Secure sustainable funding for ongoing, appropriate maintenance.	City of Flagstaff	Summer 2020	$30,000/year
Survey the property for user-created (unauthorized) roads and trails.	City of Flagstaff	Summer 2020	$3,500
Develop trail maintenance standards and schedules.	City of Flagstaff	Summer 2020	$0
Develop and maintain plant and animal species observation database.	City of Flagstaff and volunteers	On-going	$0
Monitor insect and disease occurrences.	City of Flagstaff	On-going	$0
Conduct wildlife surveys for endangered and special-status species.	City of Flagstaff with AZGFD assistance	Summer 2021 and then as needed	$5,000

Conduct reptile and amphibian surveys.	AGFD with volunteer assistance	Summer 2021	Unknown
Utilize volunteers and partner organizations to conduct trash clean ups.	City of Flagstaff	On-going	$0

Table 6: Priority Action Plan – Partnerships			
Action:	**Responsibility:**	**Potential Implementation Date:**	**Estimated Financial Requirement:**
Amend the Regional Plan and Zoning Code to reflect the outcomes of Proposition 413.	City of Flagstaff, Planning and Development	Completed	$0
Establish formal Volunteer/Docent Program for the Natural area.	City of Flagstaff	Completed, On-going	$0
Manage Site Stewards Program in partnership with Arizona State Parks.	City of Flagstaff	On-going	$0
Confirm existing agreements and/or establish new agreements with AZGFD regarding annual mammal and reptile/amphibian surveys.	City of Flagstaff	As needed	$0
Conduct meeting with Northern Arizona University representatives regarding on-site natural resource research work.	City of Flagstaff	Annual	$500 per annum
Establish informal agreements with private organizations and volunteer groups related to annual bird surveys.	City of Flagstaff	Update/renew annually	$0
Document rock art and other cultural resources.	City of Flagstaff with volunteers	Winter 2019	Unknown
Maintain communication with adjacent landowners regarding projects and events at the Preserve.	City of Flagstaff	On-going	$200 per annum