

Walnut Canyon Special Study

Under
Omnibus Public Land Management Act of 2009 (Public Law 111-11)



Prepared By:

Department of the Interior, National Park Service
Flagstaff Area National Monuments
and
Department of Agriculture, U.S. Forest Service
Coconino National Forest
Under Interagency Agreement (10-1A-11030411-014)
and
City of Flagstaff and Coconino County, Arizona

Draft: May 10, 2013

EXECUTIVE SUMMARY

The U.S. Forest Service / Coconino National Forest; National Park Service / Walnut Canyon National Monument (monument); City of Flagstaff, Arizona; and Coconino County, Arizona, cooperated in preparation of this congressionally mandated study to explore management options for the Walnut Canyon Special Study Area (Study Area). The Study Area encompasses 27,914 acres of federal (25,413 acres), state (2,036 acres), and private (465 acres) land surrounding Walnut Canyon National Monument. The federal lands in the Study Area are presently managed by the U.S. Forest Service as part of Coconino National Forest (figures 1 and 2).

The Omnibus Public Land Management Act of 2009 (Public Law 111-11) directs the “Secretary of the Interior and the Secretary of Agriculture, acting jointly, to conduct a study of the Study Area to assess:

- the suitability and feasibility of designating all or part of the Study Area as an addition to Walnut Canyon National Monument
- continued management of the Study Area by the U.S. Forest Service, Coconino National Forest
- another designation or management option that would provide both protection of resources within the Study Area and continued access to and use of the Study Area by the public”

The ensuing study examines: (1) current uses and federal management actions; (2) a range of alternative management and designation options, including evaluation of potential tradeoffs on Study Area resources, recreational opportunities, and social and economic values; and (3) natural and cultural resources. The study also summarizes public

participation and the input received during the study process.

A number of management options and designations were explored through public involvement and an agency workshop. A total of eight options were initially developed. Five of those options subsequently were dismissed as nonviable. Three management options were considered viable, including:

- continuation of current management by the U.S. Forest Service
- congressional action establishing a special designation to the Study Area
- congressional action that prohibits the exchange of lands to other than federal land management agencies

As specified by the act, the National Park Service conducted a national significance assessment of cultural resources in the Study Area to determine the suitability and feasibility of designating all or part of the Study Area as an addition to Walnut Canyon National Monument. The assessment concluded that, while important cultural resources exist outside the current monument boundary, they do not meet the level of national significance under the national historic landmark guidelines (see appendix C). The assessment identified cultural resources contiguous to the current monument boundary that, while not nationally significant by themselves, would contribute to the interpretive value of Walnut Canyon National Monument. The assessment could present opportunities for interpretive partnerships with the U.S. Forest Service and National Park Service.

This final report contains no recommendations from the U.S. Forest Service and National Park Service with respect to a preferred management option for

EXECUTIVE SUMMARY

the entire Study Area. Rather, the final report will be forwarded to the secretaries of the Department of Agriculture and Department

of the Interior. The secretaries may forward the report's findings and any departmental recommendations to Congress.

CONTENTS

EXECUTIVE SUMMARY i

INTRODUCTION 1

Study Overview 1

Public Law 111-11 (2009): Title VII (NPS Authorizations); Subtitle C (Special Resource Studies);
Section 7201 (Walnut Canyon Study) 3

Special Study Objectives 3

Report Transmittal to Secretaries 3

STUDY AREA, PROCESS, AND RELATED PLANS 5

Coconino County 5

Study Area 5

Special Study Process and Planning Team 9

Public Involvement 9

Resource Protection 9

Uses and Access 10

Other 10

Tribal Consultation 10

Related Plans and Studies 10

MANAGEMENT OPTIONS 15

Management Options Development Process 15

Management Options not Carried Forward in this Study 16

Transfer of Entire Study Area to the National Park System 16

Transfer Management Responsibility of a Selected Portion of the Study Area to Walnut
Canyon National Monument 16

A Recommendation for Congressional Designation as Wilderness 16

Joint Agency Management 17

Regional Forester Special Area Designation 17

Management Options Considered Further 18

Option 1: Continued Management by U.S. Forest Service 18

Option 2: Congressional Special Management Designation 24

Option 3: Congressional Restriction on Exchange of Lands 28

NonFederal Lands in the Study Area 28

Arizona State Trust Lands 28

Options for Private Inholdings 29

CONTENTS

CULTURAL AND NATURAL RESOURCES 31

General	31
Cultural Resources	32
Archeological Resources	32
Ethnographic Resources	32
Natural Resources	33
Wildlife, Ecosystem, and Wildlife Habitats	33
Potential Important Ecological Sites	35
Invasive Species	35
Old-growth Ponderosa Pine Forest Stands	37
Threatened and Endangered Species and Species of Special Concern	38
Watershed and Water Resources	43
Wildfire	46

MANAGEMENT OPTIONS ASSESSMENT 51

Effects to Natural and Cultural Resources	51
Option 1: Continued Management by U.S. Forest Service	51
Option 2: Special Management Designation	52
Option 3: Congressional Restriction on Land Disposal or Exchanges	53
Summary/Comparison Table and Suggestions	53

PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION 57

Tribal Consultation	58
Agency Involvement	58
Public Involvement and Agency and Tribal Consultation for the Draft Study Report	58

SELECTED REFERENCES 59

Laws and Regulations	65
----------------------	----

PLANNING TEAM 67

APPENDIXES

**APPENDIX A: Pertinent Sections of Omnibus Public Land Management Act of 2009
(Public Law 111-11)**

APPENDIX B: Acronyms and Abbreviations

**APPENDIX C: Conclusions from an Assessment of the National Significance of Cultural
Resources for the Walnut Canyon Special Resource Study, Ted Neff et al.**

FIGURES

Figure 1. Location Map for Special Study Area	2
Figure 2. Land Ownership and Special Study Area Boundaries	6
Figure 3. Existing Infrastructure	8
Figure 4. Walnut Canyon Study Area –Recreation Management	22
Figure 5. Grazing Allotments	25
Figure 6. Current Management Area 37	26
Figure 7. Sensitive Species	40
Figure 8. Fire Fuels Activities	48

TABLES

Table 1. Walnut Canyon NM Vicinity Nonnative and Invasive Plant Species	36
Table 2. Summary/Comparison Table	54

THIS PAGE INTENTIONALLY LEFT BLANK

INTRODUCTION

The U.S. Forest Service (USFS) and National Park Service (NPS), together with Coconino County and the City of Flagstaff, completed this congressionally mandated special study to explore management options for the Walnut Canyon National Monument (Monument) special Study Area (figure 1). This special study examines: (1) current land use and management actions and direction; (2) a range of alternative management and designation options; (3) natural and cultural resources; (4) analysis of management options and tradeoffs for resources, recreational opportunities, social values, and local economic resources; and (5) describes the public input process.

STUDY OVERVIEW

In the late 1980s, the National Parks and Conservation Association and Friends of Walnut Canyon (a local organization) began promoting increased protection of Walnut Canyon National Monument through congressional action. This initiative was to extend increased protection for cultural and other resources to a broader area surrounding the existing Monument boundaries. The objective of that initiative was partially achieved through a 1996 boundary expansion. Subsequent to that expansion, the support groups favored further expansion of current Monument boundaries to the proposed Study Area boundaries. The Study Area boundaries were designed to extend protection to portions of the Walnut Creek watershed and include important riparian, old growth, and endangered species habitats; protect the area from future commercial and residential development; preserve the natural scenery; reduce or eliminate motorized access; and

address fire management and forest restoration.

In 2002, responding to continued public interest to further protect the Monument and recommendations outlined in the Coconino County / Flagstaff Regional Land Use and Transportation Plan (2001), the Coconino County Board of Supervisors and Flagstaff City Council initiated a forum to fully engage the public in discussions regarding the Monument's long-term protection. The year-long process included three public open house events, distribution of an educational brochure, and completion of a community survey. Results of the survey indicated public support to enhance measures to conserve additional land of the Walnut Canyon area from future development. Public opinion was divided regarding the preferred mechanism to achieve the conservation goal. In addition, the survey revealed some reservation as to whether a Monument boundary expansion was desired.

The Coconino County Supervisors and Flagstaff City Council independently passed resolutions on unanimous votes in late 2002, requesting assistance from Congress to authorize a special study of land surrounding the Monument. In May 2004, U.S. Senator John McCain (Arizona) and Congressman Rick Renzi (Arizona) introduced federal legislation addressing and providing for a study of the Walnut Canyon area, as discussed in the public law section. The defined purpose of the special study was to: (1) evaluate the national significance of the natural and cultural resources of the Walnut Canyon area, (2) evaluate the general public's desire for recreational access to and economic benefit from the area, and (3) to identify which features and resource values require protection and preservation.

INTRODUCTION

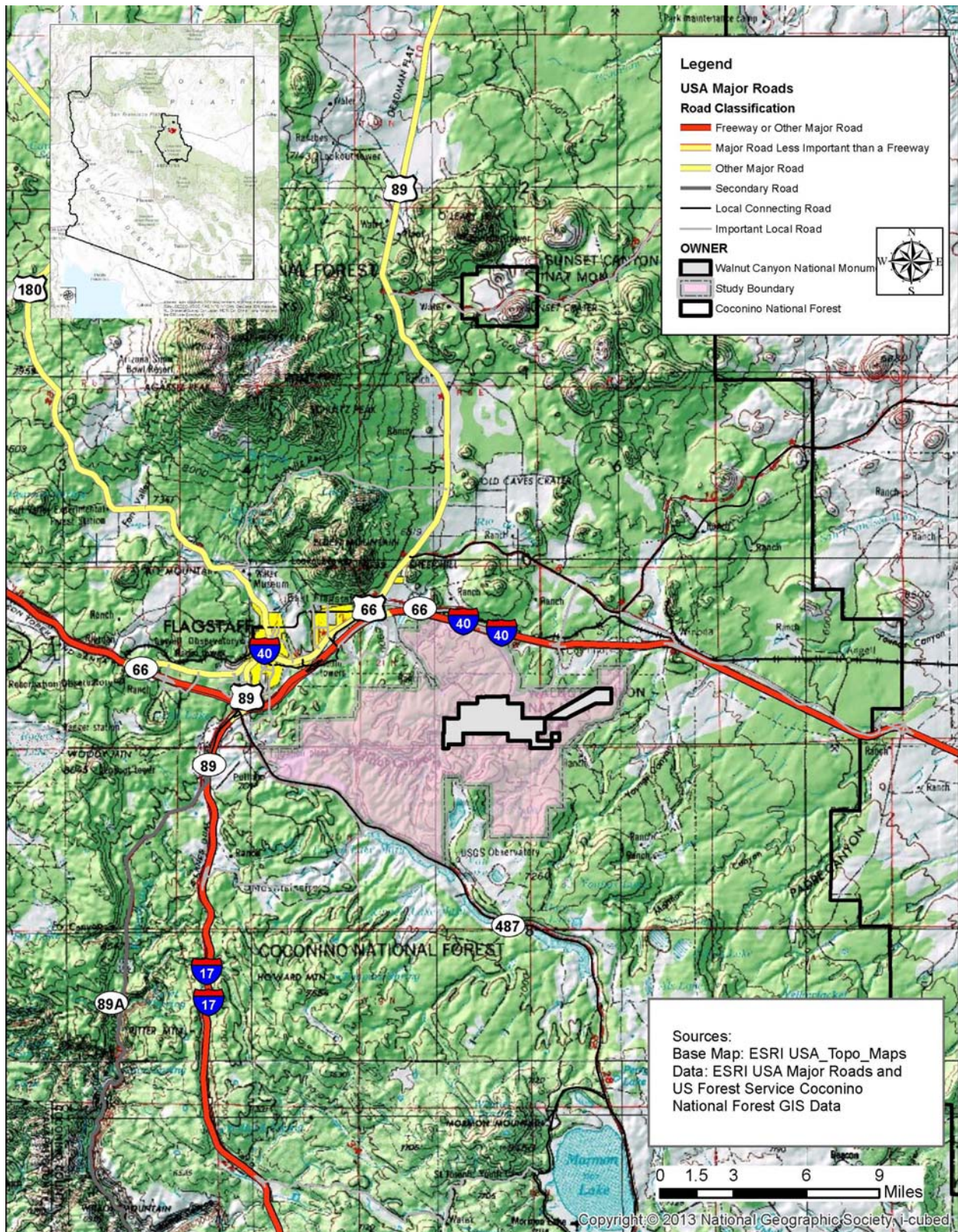


FIGURE 1. LOCATION MAP FOR SPECIAL STUDY AREA

PUBLIC LAW 111-11 (2009): TITLE VII (NPS AUTHORIZATIONS); SUBTITLE C (SPECIAL RESOURCE STUDIES); SECTION 7201 (WALNUT CANYON STUDY)

On March 30, 2009, President Obama signed the Omnibus Public Land Management Act of 2009, which had been as passed by Congress after consideration by several Congresses, including hearings and markups. The act includes section 7201 (see appendix A) directing the Secretary of Agriculture and the Secretary of the Interior to jointly conduct a special study of management options for an area encompassing 27,914 acres of federal (25,413 acres), state (2,036 acres), and private (465 acres) land to the south and east of Flagstaff, Arizona (see figures 1 and 2) and within the Flagstaff Ranger District of Coconino National Forest surrounding the existing Monument.

SPECIAL STUDY OBJECTIVES

The objectives for this study regarding future management of the Walnut Canyon Study Area is to assess potential land management designations described in the act, including:

- Suitability and feasibility of designating all or part of the Study Area as an addition to Walnut Canyon National Monument.
- Continued management of the Study Area by the U.S. Forest Service, Coconino National Forest.
- Another designation or management option that would provide both protection of resources within the Study Area and continued access to

and use of the Study Area by the public.

In order to accomplish the objectives, the study process includes the following tasks:

- An assessment of natural and cultural resources, current land use, and management actions and direction.
- Meaningful engagement with stakeholders, including the City of Flagstaff and Coconino County governments, American Indian tribes, other local and state agencies, and the general public to determine their desires and ideas for future management.
- Development and evaluation of the full range of management alternatives and designation options.
- Analysis of the impacts, both adverse and beneficial, to natural and cultural resources, recreational opportunities, the local economy, and the social values of any change in management or agency authority.
- Provide the results and findings in this special study report.

REPORT TRANSMITTAL TO SECRETARIES

This final report contains no recommendations from the U.S. Forest Service and National Park Service with respect to a preferred management option for the entire special Study Area. Rather, the final report will be forwarded to the secretaries of the Department of Agriculture and Department of the Interior. The secretaries may forward the report's findings and any departmental recommendations to Congress.

THIS PAGE INTENTIONALLY LEFT BLANK

STUDY AREA, PROCESS, AND RELATED PLANS

COCONINO COUNTY

Coconino County is in north-central Arizona, encompassing approximately 18,617 square miles (nearly 12 million acres). Elevations within the county range from 1,350 feet above mean sea level (msl) at the bottom of the Grand Canyon to 12,633 feet msl on the volcanic San Francisco Peaks (Mount Humphreys). Forests and woodlands are characterized by mixed conifers and ponderosa pine (*Pinus ponderosa*) that cover approximately 15% of the county in areas generally above 7,000 feet elevation; pinyon-juniper woodlands have become established county-wide on the approximately 40% occurring between 6,000 and 7,000 feet msl elevation. The remainder of Coconino County, generally lying between 5,000 and 6,000 feet msl, is characterized by xeric grasslands and shrubland vegetation types. Landforms supporting regional plant communities include canyons, plateaus and mesas, cliffs, slopes, cinder cones, mountains, valleys, floodplains, and relatively flat expanses.

The 2000 U.S. Census reported a resident population of 116,320 in Coconino County with the 2010 U.S. Census recording a population of 134,418; a 16% increase. Of the total resident population in 2010, about 88,400 residents (66% of the entire county population) live in the Flagstaff area, with much of the remaining population living in unincorporated rural areas.

Although Coconino County is the largest county in Arizona and the second-largest in the United States in terms of land area, it is also among the most sparsely populated. Only 13% of the county is privately owned. American Indian reservations (Navajo and Hopi, including the Kaibab-Paiute, Havasupai, and Hualapai) comprise 38% of

the land area. Federal and state agencies manage the remaining land (U.S. Forest Service [28%], Bureau of Land Management [BLM] (5%), State Land Department [9%], and the National Park Service [7%]) (Flagstaff Regional Plan 2011).

The population distribution between urban and rural areas in the county has not changed significantly since the 1960s, although substantial residential and commercial development has occurred in the southeast quadrant of the Flagstaff urban area, including the area south and east of I-40/I-17, which borders the Study Area.

County-wide, American Indians comprised 27.4% of the county population in 2010 and 11.7% of Flagstaff's resident population. The median age of residents was 25, with 6% of the population over 65 years old (Flagstaff Regional Plan 2011).

Planners in the region forecast net population growth of 15% within the regional planning area in the coming decade; a rate that would result in a population of about 103,850 by 2020, with further growth to 116,600 foreseen by 2030 (Flagstaff Regional Plan 2011).

Study Area

The Study Area encompasses 27,914 acres south and east of Flagstaff, Arizona. Land within the Study Area is administered primarily by the USDA Forest Service Coconino National Forest (91%), but the overall Study Area boundary encompasses more than three sections of Arizona State Land Department trust lands and some private land. The Study Area surrounds Walnut Canyon National Monument (see figure 2).

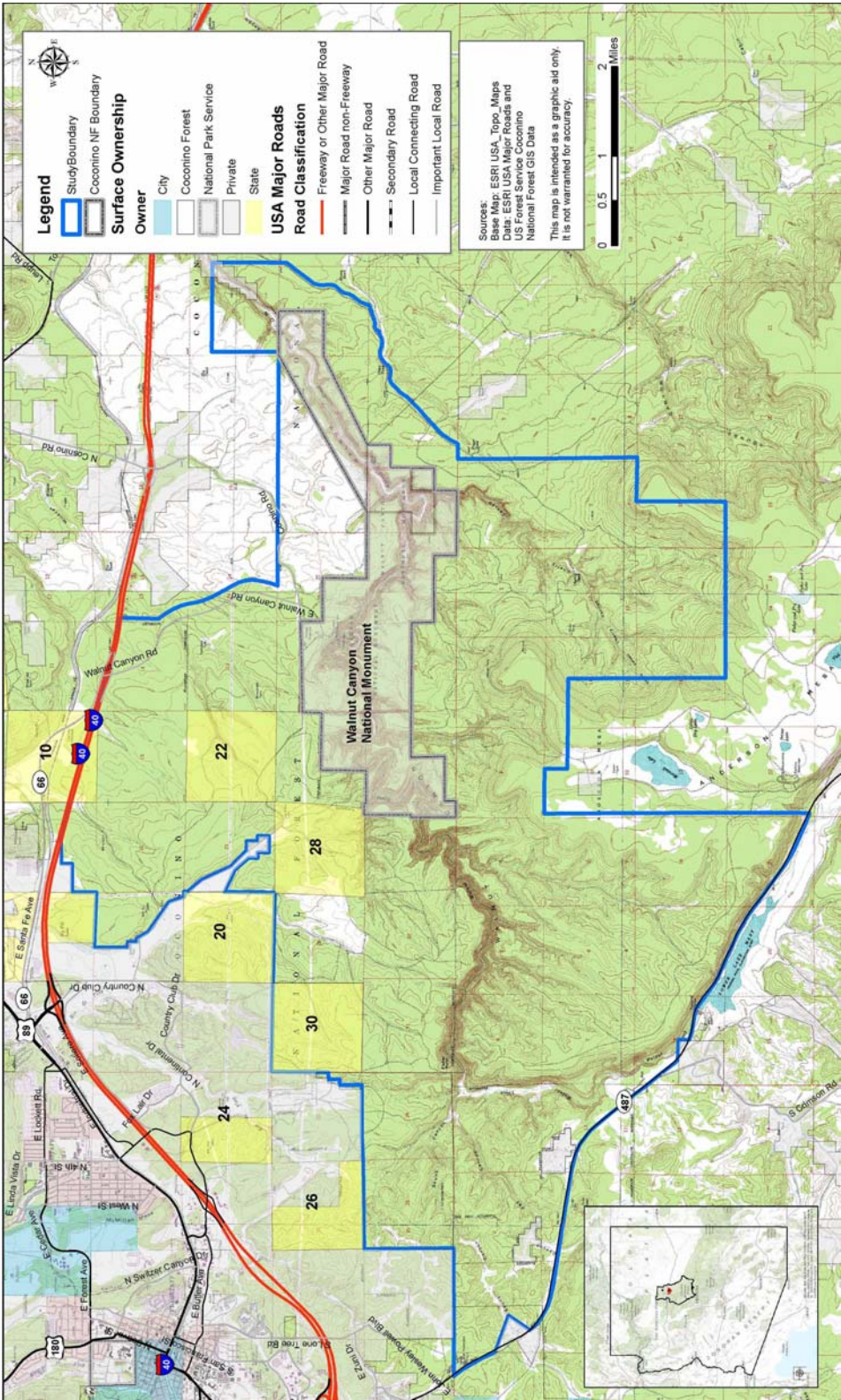


FIGURE 2. LAND OWNERSHIP AND SPECIAL STUDY AREA BOUNDARIES

Walnut Canyon National Monument was established by President Woodrow Wilson through Presidential Proclamation No. 1318 on November 30, 1915, to preserve the prehistoric ruins of ancient cliff dwellings. The Monument has since been enlarged on three occasions: (1) by Presidential Proclamation No. 2300 in 1938, (2) by Public Land Order 1269 in 1965, and (3) in 1996 when Congress expanded the boundaries of the Monument by 1,292 acres through Public Law 104-333. The most recent expansion was specifically intended to protect additional natural and cultural resources contributing to the Monument's purpose and significance. The Monument presently comprises approximately 3,600 acres (NPS 2007).

The Arizona State Land Department is the trustee for over 9 million acres of state trust land under the mission to manage trust land to enhance value and optimize economic return for 13 public beneficiaries. The Arizona State Land Department can sell or lease land at auction. While public use of trust land is not prohibited, it is regulated to ensure compensation to the beneficiaries for its use and protection. Within the Study Area, sections 20 (adjacent to) and 30, T21N R8E (within) the Study Area boundary have high development potential due to the proximity to Flagstaff, accessibility, and proximity to infrastructure (see figure 2).

There are existing cooperative agreements between the Arizona State Land Department and other agencies including: (1) a multiagency agreement for wildfire management, (2) an agreement with the Coconino National Forest and Coconino County Sheriff's Office for joint law enforcement activity, and (3) a cooperative program with Coconino National Forest for educational activities on both forest and park lands.

The Arizona Game and Fish Department's (AGFD) mission is to conserve, enhance, and restore the diverse wildlife resources and habitats throughout the state using protection and management programs.

AGFD personnel provide law enforcement relative to hunting activities under a legal mandate to manage all Arizona wildlife. The Study Area is within Game Management Units 11M and 5B, the latter being further subdivided into Unit 5B-N and Unit 5B-S (AGFD 2012a); however, the agency does not manage any land within the Study Area. The Arizona Game and Fish Department also manages the Watchable Wildlife project, which strives to increase public awareness of, and support for, wildlife through managed wildlife viewing-related recreational and educational opportunities, while not lessening existing hunting and fishing opportunities. The department wildlife biologists plan for habitat linkages to identify areas of concern for wildlife movement throughout the county.

The following infrastructure occurs within the special Study Area (figure 3):

- City of Flagstaff water treatment facilities including the treatment plant (22 acres), 5 miles of water line, four or five wells, and access roads
- Arizona Public Service electrical lines
 - distribution lines near Lake Mary Road (~6.5 miles, plus service to private inholdings)
 - 69kV line (Flagstaff to Winslow east-west ~6 miles)
 - 230kV/69kV (north-south 1.5 miles)
- CenturyLink Communications
 - local service lines (~4 miles near Lake Mary Road)
 - east-west corridor (~6 miles)
- Coconino County water line service to Fort Tuthill
- UniSource Gas Lines (minor service lines to private lands)
- North Ranch homeowners access road (~0.2 miles)
- Campbell Mesa private road (~1.1 miles)
- private water pipeline (~2.3 miles)

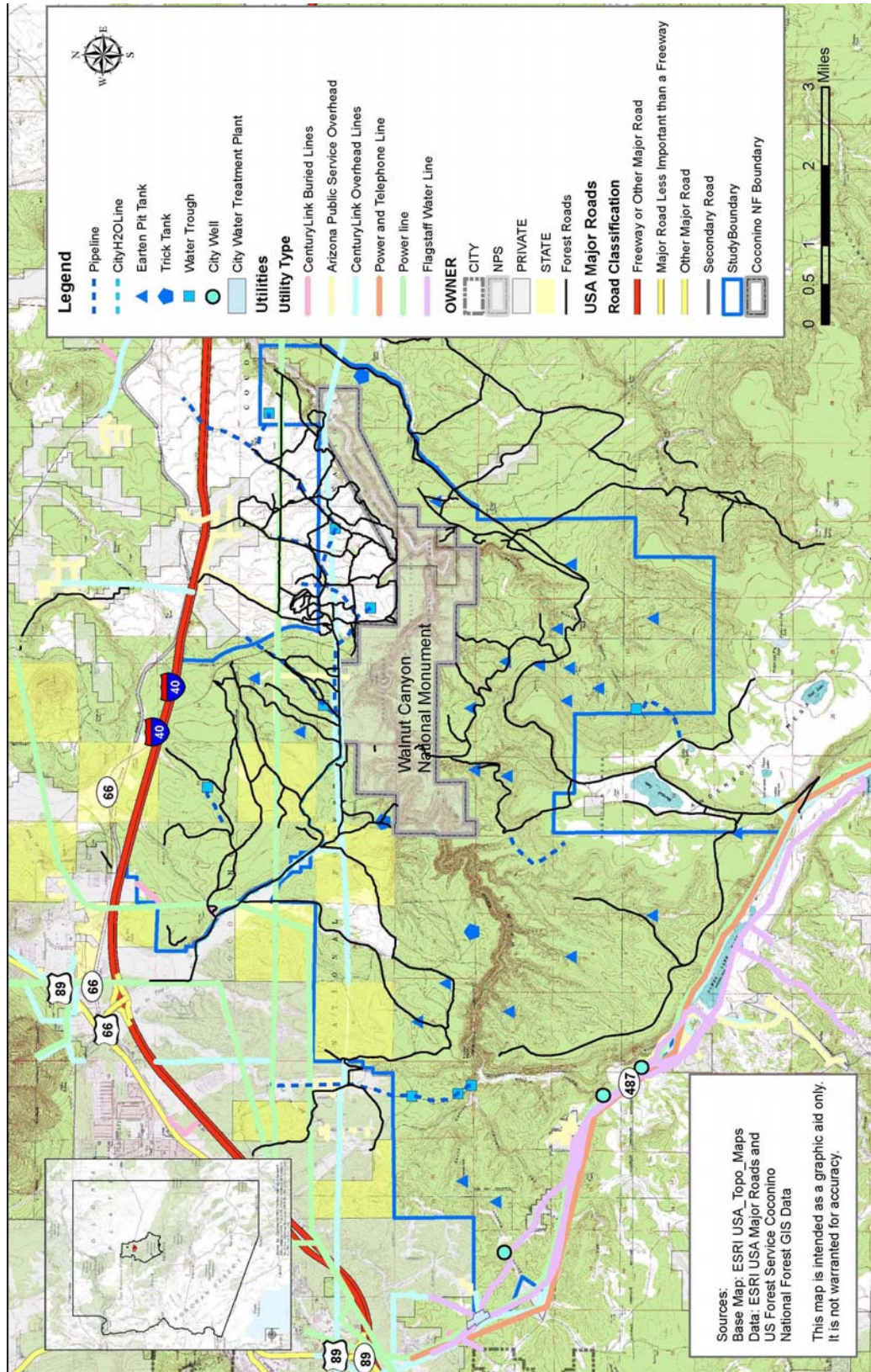


FIGURE 3. EXISTING INFRASTRUCTURE

SPECIAL STUDY PROCESS AND PLANNING TEAM

The U.S. Forest Service and the National Park Service jointly initiated this study in February 2010 to explore management options for the Study Area, per the Omnibus Public Land Management Act of 2009. The City of Flagstaff and Coconino County subsequently signed on as cooperating partners and have been participants throughout the process. A third-party contractor coordinated the interagency efforts for public involvement and took a lead role in preparing this special study report.

Major steps of the study effort included:

- **Public Involvement and Consultations.** The public, stakeholders, tribes, organizations, and other agencies were engaged throughout the study. A study website was established and meetings were held in the Flagstaff vicinity. Summaries of public comments were made available via the website at the conclusion of commenting periods.
- **Data Collection and Analysis.** Resource data were collected, including natural and cultural resources, existing management and land use, recreational uses and trends, the surrounding social and economic environment, and regional and state plans and initiatives affecting the study area.
- **An Assessment of the National Significance of Cultural Resources for the Walnut Canyon Special Study.** On-the-ground surveys were conducted by the University of Northern Arizona, Museum of Northern Arizona, of known and new areas within the study area (conclusion in appendix B).
- **Development and Assessment of Management Options.** Based on data and public input, the study team developed management options that would achieve desired goals and

resource conditions. Management options were then assessed for the meeting criteria and environmental effects.

- **Draft Study Document.** The study team prepared a draft study document describing the management options and potential effects. A draft report was prepared for public review.
- **Final Document.** Following public and government review, this final study document was prepared for submittal to the two department secretaries.

PUBLIC INVOLVEMENT

The Omnibus Public Land Management Act of 2009 directed the lead federal agencies to “meaningfully engage stakeholders, City of Flagstaff and Coconino County governments, American Indian tribes, other agencies, and the general public at local and national levels to determine their desires for future management of this area.”

The study team formulated and implemented a public involvement plan that included compiling an initial project mailing list from databases supplied by the National Park Service, U.S. Forest Service, the City of Flagstaff, and Coconino County. Additional stakeholders were identified in response to contact information provided in newsletters, a project-specific website, press releases, and open house events. (See “Management Options Assessment” for more details.)

Public comments received by the study team centered on the following topics:

Resource Protection

- natural resources including wildlife and birds, scenic and natural qualities, watershed and water quality, forested canyon, old-growth pine, geology, and solitude

- historic, archeological, and American Indian resources
- urban development resulting in encroachment to the Monument

Uses and Access

- recreational opportunities including hiking, biking, camping, climbing, horseback riding, hunting, birding, cross-country skiing, and firewood gathering
- open space near Flagstaff and as a buffer around the Monument
- educational and interpretative opportunities
- free access
- livelihood and economics – grazing, concessions, hunting, property values
- off-road vehicles
- existing trails
- fire – as a management tool for forest health

Other

- preserve in perpetuity
- no development or land swap
- private inholdings and access roads to them
- wildland fire – urban interface

Tribal Consultation

There are 13 tribes that claim cultural associations with lands within the Monument, including:

Fort McDowell Yavapai Nation
Havasupai Tribe of the Havasupai Reservation
Hopi Tribe of Arizona
Hualapai Indian Tribe of the Hualapai Indian Reservation
Kaibab Band of Paiute Indians of the Kaibab Indian Reservation
Navajo Nation

San Carlos Apache Tribe of the San Carlos Reservation
San Juan Southern Paiute Tribe of Arizona
Tonto Apache Tribe of Arizona
White Mountain Apache Tribe of the Fort Apache Reservation
Yavapai-Apache Nation of the Camp Verde Indian Reservation
Yavapai-Prescott Indian Tribe
Zuni Tribe of the Zuni Reservation

Six groups, including Apaches, Hopis, Navajos, Pais, Paiutes, and Zunis were involved in an ethnographic study in 2004 by Toupal and Stoffle. The Hopi, Navajo, and Zuni tribes conducted field research and identified ethnographic resources within the Monument.

The Study Area has not been surveyed for ethnographic resources. However, the existence of so many ethnographic resources within the Monument boundary and the number of recorded archeological resources within the Study Area indicate that there is a high probability for ethnographic resources within the Study Area. The National Park Service and U.S. Forest Service have been jointly communicating and consulting the tribes who claim cultural affiliation to the Walnut Canyon area throughout this project.

RELATED PLANS AND STUDIES

The National Park Service, City of Flagstaff, Coconino County, and Coconino National Forest have completed various planning efforts over the past 15 years addressing aspects of land use, development and management, and resident population on lands near and in the Study Area. A summary of these plans follow.

Walnut Canyon National Monument General Management Plan (2007). The *Walnut Canyon National Monument General Management Plan* (GMP), finalized in 2007, provides management guidance for the Monument for the next 10 to 15 years. The plan stresses preservation of untrailed

expanses, unfragmented natural systems, and relatively pristine conditions throughout much of the Monument. Visitation is to be managed with the goal of providing quality educational opportunities in an intimate atmosphere while striving to maintain the health of the canyon ecosystem and Walnut Canyon as a critical wildlife corridor. Visitation to the Monument is to remain day use only, with no recreational use except on designated trails near the visitor center in order to protect cultural and natural resources. Efforts will be pursued to provide a broader range of educational offerings and to open additional archeological sites to general visitor use. The general management plan also addresses boundary expansion, stating:

During the course of this planning process and as specified in Section 604 of the National Parks and Recreation Act of 1978 (16 *United States Code* [USC] 1a-5 et seq.) an assessment for expanding the boundaries of the monument was conducted.

A boundary expansion assessment initially determined that both natural and cultural resources that contribute to the purpose and significance of the monument still remain outside current monument boundaries. However, further expansion of the existing boundaries at Walnut Canyon was not recommended at the time because of current planning efforts and proposed actions by adjoining and neighboring land managing agencies. Specific planning efforts that were taken into consideration in this assessment included the following:

- The Coconino National Forest Flagstaff / Lake Mary Ecosystem Analysis (USFS 2003), which addresses public uses and recreation, wildlife habitat management, and fire risk reduction on national forest land immediately surrounding the

Monument and along the wildland urban interface.

- The City of Flagstaff Open Space and Greenway Plan (1998), which serves as a guide for the future protection of open spaces and greenways surrounding Flagstaff and adjacent communities, including lands administered by the U.S. Forest Service and the National Park Service, while also considering the demands for growth in residential, commercial, and recreational uses.
- The City of Flagstaff and Coconino County's joint Flagstaff Area Regional Land Use and Transportation Plan (2001) that applies to 460 square miles surrounding Flagstaff and addresses population growth issues adjacent to the park on the west side.
- Coconino County's Comprehensive Plan (2003), which addresses ways to protect natural landscapes throughout the county from the adverse effects of unmanaged development.
- The City of Flagstaff and Coconino County filed an application (35-107300) to have Arizona State Trust land sections 22, 28, and 30 included under the Arizona Preserve Initiative. It was felt that residential or commercial development could result in an adverse impact on park resources and negatively influence the health of the Walnut Canyon ecosystem. The application was later withdrawn and these efforts were not continued.

With these planning efforts and existing commitments by city, county, and federal agencies to work with the National Park Service to manage lands adjacent to the Monument in a compatible manner, further expansion was deemed unnecessary in 2007. The general management plan identifies circumstances that could compel a reevaluation of the need for a boundary expansion. The circumstances include:

- Changes in land use management by Coconino National Forest affecting the use of land along the interface of U.S. Forest Service land with the City of Flagstaff.
- A softening in the City of Flagstaff's commitment to limit development within the existing urban growth boundary and to effectively manage the density of development along that boundary.
- A change in land use or the sale or exchange of state trust lands that could result in the potential residential or commercial development of these adjacent lands.

Coconino National Forest Management Plan, as Amended (1987–2008) Revision.

The Coconino National Forest Land and Resource Management Plan defines management direction for the forest. The plan was prepared pursuant to the Renewable Resources Planning Act of 1974 (RRPA), as amended by the National Forest Management Act of 1976 (NFMA), and provides integrated multiple use and sustained yield of goods and services from the forest in a way that maximizes long-term net public benefits in an environmentally sound manner. A plan revision is underway, with completion expected in 2013.

The current forest plan was adopted in 1987, but has undergone several updates and amendments. The latter includes Amendment 17, adopted in 2002, a major revision to address the Flagstaff / Lake Mary Ecosystem Analysis (FLEA), which includes the Study Area. The amendment provided:

- closing drainages to motorized vehicles
- promoting recreation opportunities for the community emphasizing daytime uses, primarily nonmotorized
- managing a portion of the area for a quiet, almost primitive recreation experience

- balancing recreational demands with protection of soil, water, vegetation, and sensitive species
- protecting monument values
- maintaining scenic quality
- maintaining the wildfire-urban interface
- maintaining and improving condition and watershed function
- maintaining sensitive species habitat

The FLEA amendment also provides that "...no land exchanges will occur unless the purpose is to acquire land within this Management Area (MA 37) through exchange of national forest lands elsewhere." Any subsequent amendment of the FLEA outside of a forest plan revision would require a separate public process under the National Environmental Policy Act of 1969, as amended (NEPA), with the forest supervisor being the decision maker of record.

It is anticipated that the provisions and language in the FLEA amendment will be incorporated into the ongoing forest plan revision. The existing MA 37 boundaries are depicted in figure 6. The revised forest plan is expected to adjust the MA 37 boundary to include a small portion of the Study Area to the east of the entrance road and north of the Monument.

Coconino County Comprehensive Plan (2003).

The Coconino County Comprehensive Plan (2003) provides a vision and guidelines for development and land use in the county, while providing county officials with guidance for making decisions about zone changes and developments. The plan also sets policies for actions related to capital improvements, road construction and maintenance, environmental protection, land use, and energy use in buildings. The comprehensive plan applies to all areas of the county except American Indian reservations and incorporated cities and towns. Although the county has no jurisdiction over public lands managed by the U.S. Forest Service, National Park Service, and Bureau of Land

Management, many policies support the collaborative efforts necessary to protect the integrity of these lands. The Coconino County vision extends to the next two decades while the goals and policies are intended to serve for 10 years.

Flagstaff Area Regional Land Use and Transportation Plan (2002). The Flagstaff Area Regional Land Use and Transportation Plan (Flagstaff Regional Plan) was adopted by the Flagstaff City Council and the Coconino County Board of Supervisors in 2001 and approved by Flagstaff voters in May 2002. The plan provides guidance for local land use and transportation over the next 30 years. In 2010, the planning region had approximately 88,000 residents, with forecasts of an additional 38,000 residents and 9,000 additional dwelling units by 2030. The Flagstaff Regional Plan applies to the city and about 460 square miles of area surrounding the city, comprising the Flagstaff Regional Planning Area. Like the Coconino County Comprehensive Plan, the Flagstaff Regional Plan seeks to promote compact growth and limit urban sprawl and contains goals and policies to guide growth, density, infrastructure, and open space protection. The plan policies included measures to protect natural and cultural resources around the Monument outlining efforts to formalize various land use and management commitments by federal, state, and local government agencies. The city and county are currently developing a revised Flagstaff Regional Plan.

Flagstaff Urban Trails System Plan and Flagstaff Loop Trail. The Flagstaff Urban Trails System (FUTS) is a citywide network of nonmotorized, shared-use pathways used by bicyclists, walkers, hikers, and runners, both for recreation and transportation purposes. The overall master plan presently includes 130 miles of trails; just over 50 miles presently exist. The overall FUTS system plan will connect neighborhoods, shopping, places of employment, schools, parks, open space, and the surrounding national forest, and allow users to combine transportation,

recreation, and contact with nature. According to the City of Flagstaff Citizen Survey 2009, 78% of Flagstaff residents had used the urban trails system in the preceding year. A more recent survey reported that more than 75% of urban trails users used the trails at least once per week.

The goal of the Flagstaff Loop Trail would be to complement the urban trails system by providing a multiuse, nonmotorized recreational experience near the urban fringe. The vision is for a 42-mile-long route that would circumnavigate Flagstaff, with linking trails acting as spokes into the city. Future trails could also link to the communities outside the city limits and to the network of USFS trails. The Flagstaff Loop Trail will use a variety of USFS trails, abandoned roads, the Flagstaff Urban Trail System, state land department trail easements, and the Arizona Trail.

An Assessment of the National Significance of Cultural Resources for the Walnut Canyon Study Area (2011).

Congress specifically included the suitability and feasibility of designating all or part of the Study Area as an addition to Walnut Canyon National Monument as an option. Consequently, the National Park Service must provide decision makers and legislators with information regarding whether lands within the Study Area satisfy NPS criteria for national significance. A new national monument area or additions to existing national park system units must meet criteria for national significance, suitability, and feasibility. The National Park Service is responsible for screening proposals for new national park system units or adding land to existing units to assure that only the most outstanding resources are added to the national park system.

Units of the national park system are managed under mandates that are fundamentally different from those guiding many other federal land management agencies. Rather than managing resources for multiple use or commodity production as are

many federal lands, the National Park Service is responsible for managing areas to provide for public enjoyment in such a way that leaves resources “unimpaired for the enjoyment of future generations.” To be eligible for favorable consideration as a unit of the national park system, an area must possess nationally significant natural, cultural, and or recreational resources. A proposed unit will be considered nationally significant if all of the following four standards are met:

1. It is an outstanding example of a particular type of resource.
2. It possesses exceptional value or quality illustrating or interpreting the natural or cultural themes of our nation’s heritage.
3. It offers superlative opportunities for recreation for public use and enjoyment or for scientific study.
4. It retains a high degree of integrity as a true, accurate, and relatively unspoiled example of the resource.

In 2011, the National Park Service completed an assessment to determine whether cultural resources existed outside the current Monument that are directly related to the purposes of the Monument and the addition of which would be eligible in order to contribute to the purposes of this national park system unit. The assessment concluded that, while important resources exist outside the current monument boundary, they do not rise to the level of national significance by meeting all four criteria listed above.

Wildlife Linkages – Arizona Game and Fish. In 2009 and 2010, stakeholders

representing a broad range of organizations and interests participated in workshops to identify and map the sites of important wildlife linkages across Coconino County. Participants included biologists, land managers, planners, and other professionals from federal, state, tribal, private, and nongovernmental organizations. The workshops were supported by a partnership between the Arizona Game and Fish Department, Coconino County, and the Arizona Wildlife Linkages Workgroup known as the Coconino County Wildlife Connectivity Assessment. The goal of this partnership is to encourage biologists and nonbiologists alike to incorporate information about wildlife linkages and strategies for their conservation into land use decisions. The workshops provided a forum in which stakeholders shared and discussed their knowledge, outlined the general locations of wildlife linkages on large maps, and provided descriptive information about each linkage on datasheets. According to the Coconino County Wildlife Connectivity Assessment: Report on Stakeholder Input March 2011, a large portion of the Study Area has important linkage for mountain lion, elk, mule deer, black bear, northern goshawk, Mexican spotted owl, neotropical migratory birds, turkey, northern leopard frog, bats, bald eagle, peregrine falcon, tarantula, gray fox, raccoon, coyote, small mammals, cull snakes, pronghorn, and white-tailed deer. Participants also identified the locations of barriers such as highways and railroads that can interfere with wildlife movements (www.azgfd.gov). This involvement does not represent the interests of Arizona State Land Department.

MANAGEMENT OPTIONS

MANAGEMENT OPTIONS DEVELOPMENT PROCESS

The Omnibus Public Land Management Act of 2009 directs the agencies to look at options that: (1) protect resources within the study area, and (2) provide for continued public access to and use of the study area.

Representatives of the four partner agencies for the special study and the Arizona State Land Trust participated in a two-day workshop to develop preliminary management options in March 2011.

The workshop objectives were to:

- establish common understanding of existing resources, uses, and management of the study area
- review all public and stakeholder comments received to date
- define management options for the study area based on this understanding, public input, preliminary research on land designation options, and discussion between the agencies
- discuss the merits and tradeoffs of each of the preliminary management options

Following development of an initial series of management options, individual options were discussed based on the following issues developed from public interest and input:

Does the management option:

- Fall within the range of options listed in the act?
- Preserve the area from development in perpetuity (all or part)?
- Protect resources (all, which ones)?
- Allow for continued public uses (all, which ones [recreation, commercial,

education and interpretation, research, etc.]?)

- Allow for continued public access (all, limited, type, etc.) and in what format (fee-based, free, etc.)?
- Could the management option be extended to encompass other areas, e.g., Arizona State Land Department or private lands if such lands were acquired by the federal government in the future?

The outcomes of the workshop were distilled into seven options

1. continuation of current management by the U.S. Forest Service
2. congressional action establishing a special designation to the study area
3. congressional action that prohibits the exchange of lands to other than federal land management agencies
4. transfer of the study area as a new unit in the national park system
5. transfer management responsibility of a selected portion of the study area to Walnut Canyon National Monument, with continuation of current management of the remaining areas by the U.S. Forest Service
6. a recommendation for congressional designation of the study area as wilderness
7. joint agency management

The first three of these were carried forward for further assessment. The latter four options were considered but not carried forward. The basis for the decision are summarized in the following section.

MANAGEMENT OPTIONS NOT CARRIED FORWARD IN THIS STUDY

Transfer of Entire Study Area to the National Park System

Congress specifically defined designation of all or part of the Study Area as an addition to Walnut Canyon National Monument as a management option. The National Park Service is responsible for screening proposals for new national park system units or adding land to existing units to assure that only nationally significant resources are added to the national park system. As also noted, the national park system and individual park units are managed under mandates that fundamentally differ from those guiding many other federal land management agencies. The National Park Service is responsible for managing areas to provide for public enjoyment in such a way that leaves resources “unimpaired for the enjoyment of future generations.” Authority to modify park unit boundaries is included within the Land and Water Conservation Fund Act amendments of June 10, 1977 (Public Law 95-42).

As discussed previously, an area must possess nationally significant natural, cultural, or recreational resources to be eligible for favorable consideration as a unit of the national park system. National significance requires that the proposed unit or area meet *all* four of the following standards are met:

1. It is an outstanding example of a particular type of resource.
2. It possesses exceptional value or quality illustrating or interpreting the natural or cultural themes of our nation’s heritage.
3. It offers superlative opportunities for recreation, for public use and enjoyment, or for scientific study.
4. It retains a high degree of integrity as a true, accurate, and relatively unspoiled example of the resource.

In 2011, the National Park Service contracted to the Museum of Northern Arizona to conduct a literature search and an archeological assessment of the cultural resources in the Study Area, outside the existing Monument boundaries. The assessment concluded that even though critical and significant cultural resources exist within the Study Area, they did not rise to the level of national significance by meeting the four criteria listed directly above. Consequently, the study area as a whole does not meet the criteria for inclusion in the national park system (Neff et al. 2011).

Transfer Management Responsibility of a Selected Portion of the Study Area to Walnut Canyon National Monument

As noted above, the National Park Service conducted an archeological survey and an assessment of the national significance of the cultural resources in the Study Area. The assessment identified cultural resources contiguous to the current monument boundary that, while not nationally significant by themselves, would contribute to the interpretive value of Walnut Canyon National Monument. This could present opportunities for interpretive partnerships with the U.S. Forest Service and National Park Service.

A Recommendation for Congressional Designation as Wilderness

With passage of the 1964 Wilderness Act (16 USC 1131 et seq.), Congress declared it to be national policy to secure for present and future generations the benefits of enduring wilderness resources. The purpose of wilderness designation, which is accomplished solely by congressional action, is to preserve and protect wilderness characteristics and values over the long term,

while providing opportunities for solitude or primitive and unconfined recreation.

The U.S. Forest Service completed an inventory of potential wilderness areas for Coconino National Forest in 2009. The study area was not carried forward for wilderness evaluation because it does not meet the criteria for inventory in Forest Service Handbook 1909.12, chapter 71.1. The handbook states that areas considered for potential wilderness must meet the following criteria:

- areas that do not contain forest roads, or other permanently authorized roads
- areas that are at least 5,000 acres in size or less than 5,000 acres but meet one or more of the following criteria:
 - area can be preserved due to physical terrain and natural conditions
 - area is a self-contained ecosystem, such as an island, that can be effectively managed as a separate unit of the National Wilderness Preservation System
 - area is contiguous to an existing wilderness, primitive area, administration-endorsed wilderness, or other potential wilderness in other federal ownership, regardless of size.

Additional information on the process can be found at <http://www.fs.usda.gov/detail/coconino/landmanagement/planning/?cid=stelprdb5335067>.

Joint Agency Management

A joint management structure involving the two federal agencies, and possibly the City of Flagstaff and Coconino County, had been suggested by the public and was discussed at the management options workshop in 2011 and subsequently dismissed by consensus among the four partner agencies. The federal

agencies, the city, and county currently cooperate on many planning and management concerns. Formalizing this management structure for the study area through congressional concurrence and the subsequent administrative requirements for compliance with the Federal Advisory Committee Act, creating yet another layer of bureaucracy, was the major drawback for this option. Concerns were voiced by all of the partner agencies that joint management would require increased commitment of staff and other resources at a time when resources are stretched thin. In addition, joint management would require implementation of special management procedures by the Coconino National Forest since U.S. Forest Service personnel are generally not currently assigned to a specific management area.

Regional Forester Special Area Designation

This option was not evaluated during the options workshop, but was discussed with the U.S. Forest Service at a later date. It was included in this report to ensure consideration as a management option.

Under 36 *Code of Federal Regulations* (CFR) section 294 *Special Areas*, the U.S. Forest Service can designate special areas to recognize special values of certain areas and to tailor land uses to interpret, maintain, and enhance those special features. Special areas can be designated for scenic, geologic, botanic, zoologic, paleontologic, archeologic/historic, or recreation values, or combinations of these values.

Of the special area designations, recreation area would be the most appropriate designation. The regulations (section 294.1) state: suitable areas of national forest land, other than wilderness or wild areas, which should be managed principally for recreation use may be given special classification as follows:

- a. Areas that should be managed principally for recreation use substantially in its natural condition and on which, in the discretion of the officer making the classification, certain other uses may or may not be permitted, may be approved and classified by the chief of the Forest Service, or by such officers as the chief may designate if the particular area is less than 100,000 acres. Areas of 100,000 acres or more will be approved and classified by the Secretary of Agriculture.
- b. Areas that should be managed for public recreation requiring development and substantial improvements may be given special classification as public recreation areas. Areas in single tracts of not more than 160 acres may be approved and classified by the chief of the Forest Service or by such officers as the chief may designate. Areas in excess of 160 acres will be classified by the Secretary of Agriculture. Classification hereunder may include areas used or selected to be used for the development and maintenance as campgrounds, picnic areas, organization camps, resorts, public service sites (such as for restaurants, filling stations, stores, horse and boat liveries, garages, and similar types of public service accommodations), bathing beaches, winter sports areas, lodges, and similar facilities and appurtenant structures needed by the public to enjoy the recreation resources of the national forests. The boundaries of all areas so classified shall be clearly marked on the ground and notices of such classification shall be posted at conspicuous places thereon. Areas classified under this section shall thereby be set apart and reserved for public recreation use and such classification shall constitute a formal closing of the area to any use

or occupancy inconsistent with the classification.

During review of existing special areas, a USFS chief may determine that an area no longer fits the desired conditions and/or designation applied to it. In this case, the designation should be removed. If the area is within the designation authority of the responsible official, then removal of the designation may proceed. When authority does not lie with the responsible official, but rather a higher official or part of government, the U.S. Forest Service can only recommend removal of the designation.

This option would raise the designation to a higher level within the U.S. Forest Service; however, the U.S. Forest Service does not intend to manage this area as a designated recreation area and install additional recreation developments.

MANAGEMENT OPTIONS CONSIDERED FURTHER

During the management option workshop, the boundaries of the study area were discussed. It was determined by the team that altering or adjusting the study area boundaries was outside the scope of this special study. Therefore, all management options include the study area in its entirety. It is acknowledged that Congress could alter the study area boundaries if a new management option is authorized.

Option 1: Continued Management by U.S. Forest Service

The U.S. Forest Service currently manages the majority of the federal land within the Study Area boundary. USFS management balances resource protection with a multiple-use mission. Under the umbrella of the forest plan, the U.S. Forest Service plans and implements a wide variety of site-specific

activities and projects, including fire hazard reduction, forest health, grazing allotments, firewood cutting, trail and recreational facility development, materials quarries, wildlife habitat management, riparian restoration, invasive vegetation management, and off-road recreation management.

Recreational Use, Access, Use Fees, and Aesthetic Qualities.

Recreational Uses—Traditional and current forest uses by residents and visitors to the Flagstaff area include horseback riding, recreational vehicle uses, hiking, camping, rock climbing, hunting, birding, woodcutting, shooting, and mountain biking. Recreational facilities include the Canyon Vista Campground (concessioner operated); the Arizona National Scenic Trail; several trails connecting to the Flagstaff Urban Trail System; approximately 32 miles of USFS-managed hiking, biking, and equestrian trails; and an approximately 8-mile segment of the future Flagstaff Loop Trail is planned within the Study Area. A section of the Arizona Trail passes by the northwest corner of the Monument (see figure 4). There are currently two special uses permits for horseback riding and sleigh riding (in the winter), and rock climbing. There are also special events in the Study Area, which include Boy Scout jamborees, a benefit walk hosted by a local elementary parent-teacher organization, and a bike race sponsored by the Flagstaff Athletic Club. Other special events may be permitted by request.

Fisher Point is a popular destination for hikers, mountain bikers, and outfitter/guided horseback riding trips. Canyon Vista is popular for climbing. North and west of Walnut Canyon, the area provides dispersed recreation opportunities and receives heavy use adjacent to private land and Lake Mary Road. The areas south and east of Walnut Canyon provide more remote dispersed recreation opportunities.

Recent management projects in the area include closing areas to firearms discharge

for recreational shooting (hunting is still allowed in designated areas and managed in consultation with the Arizona Game and Fish Department), changing the management of travel access by motorized vehicles.

Forest resources include ponderosa pine, pinyon pine, and Utah juniper, which attract woodcutters seeking firewood. Wildlife resources in the area include pronghorn, elk, deer, black bear, mountain lion, turkey, and waterfowl, exemplifying the diverse habitat so close to city development and attracting hunters and wildlife viewers.

Woodcutting, shooting/hunting, and off-road vehicle activities are evident throughout the Study Area. Although the Monument has a fenced boundary, occasionally, these incompatible activities occur on Monument property (NPS 2007).

Access and Roads—In 2005, the U.S. Forest Service published a rule for providing motor vehicle access to national forests and grasslands. The rule requires each national forest and grassland to designate those roads, trails, and areas open to motorized use. The Coconino National Forest signed a Record of Decision on the travel management plan on September 28, 2011. The decision and final environmental impact statement are available on the Coconino National Forest website: (<http://www.fs.usda.gov/detail/coconino/landmanagement/projects/?cid=stelprdb5263010>). Implementation of these new rules went into effect on May 1, 2012, and, since that time the U.S. Forest Service has been closing many miles of informal and two-track roads throughout the forest including some within the special Study Area. This plan does not preclude the U.S. Forest Service from constructing temporary roads to address resources and fuel issues, but these temporary roads would not expand transportation routes in the forest.

The Study Area has a system of roads and trails maintained primarily by Coconino National Forest (figure 4). Walnut Canyon Monument Entrance Road (NF 622) is

maintained by the National Park Service; other named roads north of the Monument and south of I-40 include East Old Walnut Canyon Road, South Cosnino Road, South Tall Tales Road, and East Wapia Trail. U.S. Forest Service road and trail segments within the Study Area include: B 301, NF 128, NF 303, NF 790, NF 9121, NF 9125, NF 9129, NF 9135, NF 9160, NF 9169, NF 9170, NF 9172, NF 9475, NF 9481, NF 9482, NF 9483, NF 9484, and NF 9489. No paved roads or utility corridors occur except on the boundaries. Road maps are available on the Coconino National Forest website. The travel map is expected to be revised in April 2013, and each year the U.S. Forest Service will revisit the travel management plan. Walnut Canyon and its major side drainages are closed to motorized vehicles.

The principal access to the Monument is via I-40, approximately 5 miles southeast of the city of Flagstaff and a paved 3.0-mile entrance road (2.1 miles long before entering Monument boundaries). The entrance road was constructed in 1963 and was built specifically to provide access from I-40 to the Monument. The entrance road provides the primary access to the north rim and to the residential area and maintenance complex. The road terminates at a loop parking lot immediately adjacent to the visitor center. Three small turnouts with picnic areas were constructed along the roadway; two are on the west side of the road and one is on the east side (NPS 2007).

Forest Road 128 is accessed via I-40 at the Townsend/Winona exit, approximately 6 miles east of the Walnut Canyon exit. Forest Road 128 accesses Anderson Mesa and Marshall Lake, terminating at Lake Mary at the intersection of Forest Highway 3 (Lake Mary Road). Forest Road 128c, a 3.4-mile spur road off Forest Road 128 was constructed by the U.S. Forest Service in the 1980s. Forest Road 128c provides access to the south Monument boundary; however, there is no vehicular access within the Monument (USFS 2011a).

The National Park Service maintains the entrance road (NF 622); use of the entrance road and Forest Road 303 is not restricted; however, the entrance to the Monument is gated just beyond the entrance station and locked at night. There are two official USFS roads (303 and 622) to the west and northwest of the Monument boundary (USFS 2011a).

Trails within the Monument are minimal and include the 0.9-mile-long Island Trail, 0.7-mile-long Rim Trail (plus a short spur), and a short trail to the picnic area (NPS 2007). The Island Trail is paved and includes 240 steps to traverse the 185-foot elevation gain, which allows interpretation and observation of Sinagua structures. A section of the Arizona Trail passes the northwest corner of the Monument and is used by local and regional visitors for recreational purposes. Because of this proximity, occasional inappropriate uses occur on Monument property, including trespass, shooting, hunting, woodcutting, and vehicle travel.

Public access via Forest Service roads on the south rim of Walnut Canyon and the lack of NPS presence make protection of managed resources difficult. The extensive travel time (approximately one-hour via Forest Road 128) to the south rim poses difficulties in responding to emergencies in a timely fashion. The inability to regulate the use of Coconino National Forest roads adjacent to Monument boundaries makes protection of resources difficult and unauthorized access often occurs (NPS 2007).

General access and use of USFS lands within the Study Area is currently at no charge. Per the Recreation Enhancement Act, fees may be charged for developed sites (including trailheads), however, there is currently no authority to charge fees for general access to forest-managed lands. There are overnight camping fees for Canyon Vista Campground. There are day use fees for the Monument for users who do not have annual or lifetime National Parks Service or Federal Recreational Lands pass.

Aesthetic Quality—The scenery is described by the U.S. Forest Service as spectacular. The canyon itself supports a multitude of vegetation types and habitats from steep north-facing mixed conifer, to riparian vegetation at the canyon bottom. Lands outside the canyon are populated by ponderosa pine with Gambel oak understory, and some pinyon and juniper. Developments such as roads, trails, camping, day-use sites, and trailheads mimic local materials and landscape characteristics to blend with the adjacent natural-appearing landscape.

Current Study Area Management and Other Land Uses. The west and northwestern portion of the Study Area is a checkerboard pattern of sections of Coconino National Forest and Arizona State Trust Lands, while the southern boundary adjacent lands are managed by Coconino National Forest. The easily accessible forests adjacent the north canyon rim were heavily logged between 1880 and 1925 and a series of salvage cuts was conducted during the 1960s. Terrain south of the canyon rim is much less accessible and was not extensively logged until the 1970s.

In addition to federal regulations and USFS management policies, the primary management guidance is presented in the *Coconino National Forest Land and Resource Management Plan*. Under the umbrella of the forest plan, the U.S. Forest Service plans and implements a wide variety of site-specific activities and projects, including fire hazard reduction, forest health, grazing allotments, firewood cutting, trail and recreational facility development, materials quarries, wildlife habitat management, riparian restoration, invasive plant management, and off-road recreation management. As federal agencies, the U.S. Forest Service and the National Park Service routinely communicate and participate in planning activities that

mutually affect resources and agency missions. Forest resources include ponderosa pine, pinyon pine, and Utah juniper, which attract woodcutters seeking firewood. There are pronghorn, elk, mule deer, black bear, mountain lion, and Merriam's turkey that attract big-game hunters and wildlife viewers (NPS 2007).

There are portions of three grazing permit allotments administered by Coconino National Forest and used by local ranchers in the Study Area (see figure 5). A number of Flagstaff, Coconino county, and private water wells and waterlines are in the Study Area, as are numerous stock watering tanks with the associated water rights claims pending adjudication. Other infrastructure within the Study Area includes the City of Flagstaff water treatment facilities, Arizona Public Service electrical lines, telecommunication lines, gas lines, home owner access and private roads.

Information from the U.S. Geological Survey (USGS) indicates that some lands in the Study Area have geological deposits for oil and coal; however these resources are not to be of an industrial scale (Haines, USFS 2013). Geothermal resources have been identified outside the Study Area near Sunset Crater, and are currently being studied by the U.S. Geological Survey and private corporations for potential geothermal development. Minerals, including cinder, pumice, gypsum, miscellaneous clays, sulfur, and uranium, are reported in the Study Area. There are no active mineral rights in the Study Area (Haines, USFS 2013), and it is unknown to what extent these minerals exist at commercially valuable levels in the Study Area (NPS 2007).

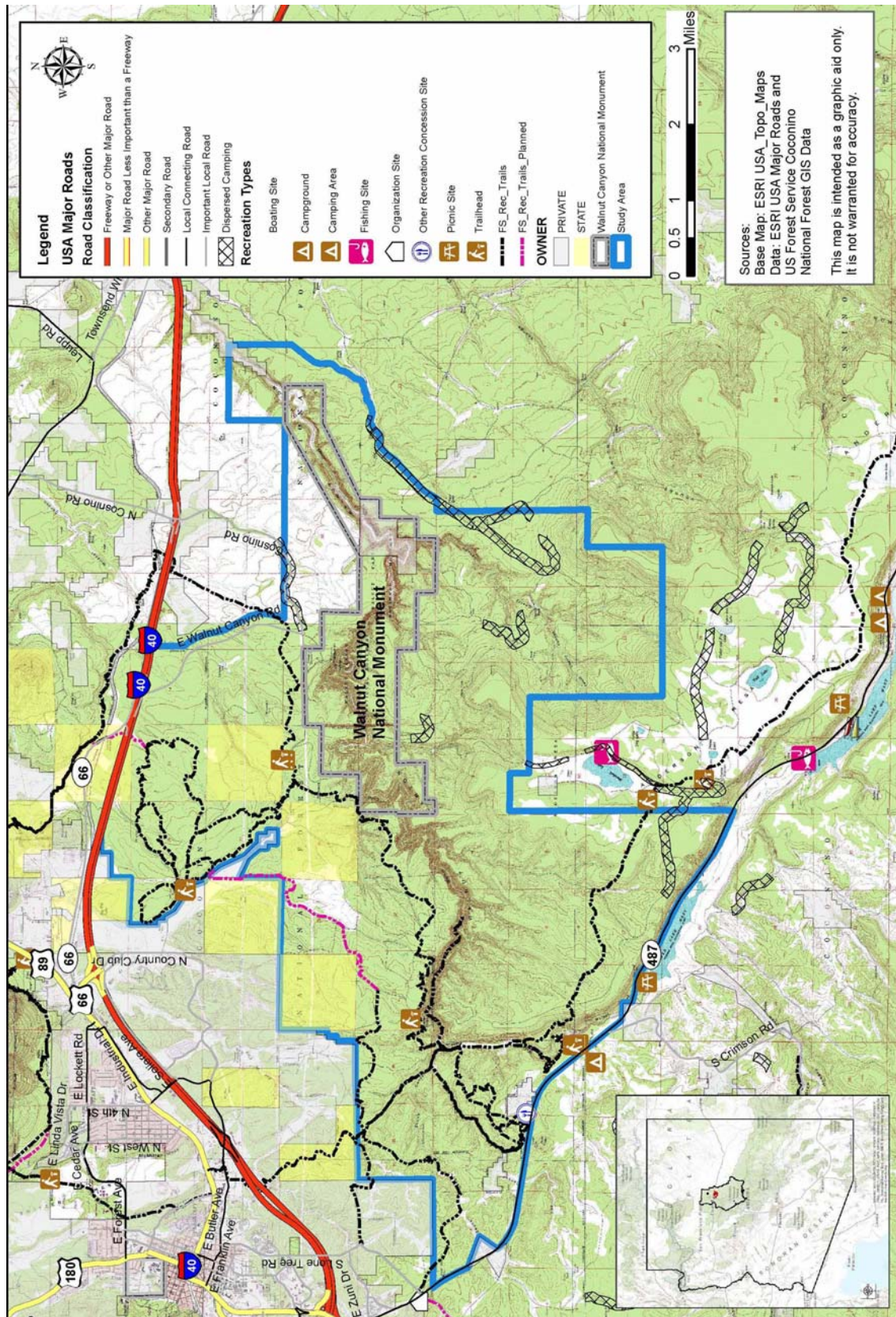


FIGURE 4. WALNUT CANYON STUDY AREA – RECREATION MANAGEMENT

The northwestern boundary of the Monument coincides with the incorporated boundary of Flagstaff and is currently within 2 miles of the present limit of residential development on the edge of the city. In addition, unincorporated neighborhoods are spreading outside the city limits to the north and northwest of the Monument. USFS and NPS staff are cooperating in the long-range land use planning efforts of the City of Flagstaff and Coconino County. User activities and resource protection needs occasionally involve U.S. Forest Service, Arizona Department of Game and Fish, City of Flagstaff, Coconino County, and other units of the national park system (NPS 2007). As the City of Flagstaff continues to grow additional residential and commercial development would occur along the western edge of the Study Area. Recreational use in the area would also be expected to increase, along with the potential for human-wildlife interactions, including with mountain lions.

The Coconino National Forest developed the Marshall fuels reduction and forest restoration treatments on approximately 12,000 acres southeast of Flagstaff, roughly between Lake Mary Road and Walnut Canyon (USDA 2010). The Marshall project is to reduce the risk of uncharacteristic wildfire and to improve the health of the forest and associated habitats in the Marshall project area. The ponderosa pine forests of northern Arizona were primarily adapted to a low intensity, high frequency fire regime that burned the forest floor every 2 to 12 years and left most large trees alive. However, fire suppression during the last 125 years has resulted in a lack of low intensity, high frequency fires. Many stands are at high risk for severe, stand-replacing wildfires that are not natural to this ecosystem, have long term ecological impacts, and pose threats to human safety and property. This project is on hold pending the outcome of this study (Haines, USFS 2013).

Four national forests (Kaibab, Coconino, Apache-Sitgreaves and Tonto) are actively engaged in a collaborative, landscape-scale

initiative designed to restore fire-adapted ecosystems in the Southwestern Region. The overall goal of the Four Forest Restoration Initiative (4FRI) is to restore the structure, pattern and composition of fire-adapted ecosystems to provide for fuels reduction, forest health, and wildlife and plant diversity (USDA 2011a).

In 2012, the City of Flagstaff purchased 480 acres near the water treatment plan in a state land auction which it has wanted to protect from development for 30 years. Picture Canyon holds ancient petroglyphs and lush vegetation that hosts wildlife.

The current Coconino National Forest Management Plan for Management Area 37 (MA 37), which includes the Study Area, states that no land exchanges will occur unless the purpose is *to acquire land within* MA 37 through exchange of lands of national forest elsewhere (figure 6). Under this policy, the U.S. Forest Service could possibly trade lands elsewhere to acquire inholdings within MA 37, but no USFS lands within the management area would be exchanged in order to acquire lands or resource interest outside MA 37. This limitation on exchanges represents the strongest management policy that can be made at the individual forest level. Forest plans, significant amendments, and forest plan revisions are approved by the regional forester. This policy language is expected to be carried forward in the forest plan revision currently being developed; with a draft to be available during the fall/winter of 2012–13. (For more information on the forest plan revision, see the Coconino National Forest website: <http://www.fs.usda.gov/detail/coconino/landmanagement/planning/?cid=stelprdb5334655>).

Once a “no exchange” policy using lands in MA 37 has been adopted, a future change is technically possible; however, in practical terms, future changes are unlikely and could be implemented only through a management action subject to public involvement. Final decisions regarding changes to the forest plan, following public involvement, are under

the authority of the forest supervisor, while actual land exchanges can only be authorized at a higher level by the regional forester. Anything more restrictive with respect to limitations on land exchanges or disposal would require congressional action.

Option 2: Congressional Special Management Designation

Congress can designate special management areas within the national forest system and other public lands. Nearly 100 special management areas have been established on federal lands. The legislation establishing each special management area is unique, but the designations generally are assigned to one of the following categories: national monuments, game refuges, scenic areas, recreation areas, and other protected areas.

Relationships between regional federal, state, and local agencies are strong and cooperation is excellent. Emergency responses in the Walnut Canyon area originate from the various land management agencies and public safety organizations. The National Park Service provides assistance with law enforcement, search and rescue, emergency medical assistance, and wildfire management in the immediate area. Coconino County deputizes NPS rangers and members of the NPS staff serve as crew on national forest fire-fighting teams. Coconino County also provides law enforcement and search and rescue services. The U.S. Forest Service provides law enforcement relative to recreation, consumptive uses, grazing, and wildfire suppression. Arizona Department of Game and Fish provides law enforcement relative to hunting activities. The Arizona Department of Public Safety provides law enforcement (traffic) on primary roads and air support in search and rescue operations (NPS 2007). The City of Flagstaff (Guardian Ambulance) provides medical emergency responses (ground and air).

There are several cooperative agreements with other agencies. There is a multiagency agreement for wildfire management. There is an agreement (updated in 2012) with the National Park Service, Coconino National Forest, and Coconino County Sheriff's Office for joint law enforcement activity. The National Park Service and Coconino National Forest have a cooperative program for educational activities on both forest and park lands. There is also an annual contract between the National Park Service and the City of Flagstaff for structural fire suppression (NPS 2007).

Permanent Protection. Nonfederal lands adjacent to and within the Study Area are managed by the Arizona State Land Department and within the planning framework of the Flagstaff and Coconino County. The City of Flagstaff has annexed all lands adjacent to the northern and western boundaries of the Study Area. Flagstaff is rapidly expanding and residential development is also occurring on private lands to the northeast of the Study Area near the communities of Cosnino and Winona.

The planning framework recognizes the potential for future residential and commercial development in the southeast portion of urban area adjacent to the Study Area, but discourages development across most of the area. Two of the state land sections (20 and 30) are within a long-term planning reserve area defined in the Flagstaff Regional Plan and have high development potential such that it is generally anticipated that they will be developed within the next 10 to 30 years. Recognizing local interest in compact development, and also open space conservation and limiting impacts on public lands, the state, county, and city hope to achieve internal buffering of lands adjacent to the U.S. Forest Service. Other Arizona State Land Department lands are less developable and thus would have lower value, raising the possibility for future conservation through sale, exchange, or placement of a conservation easement or other mechanism.

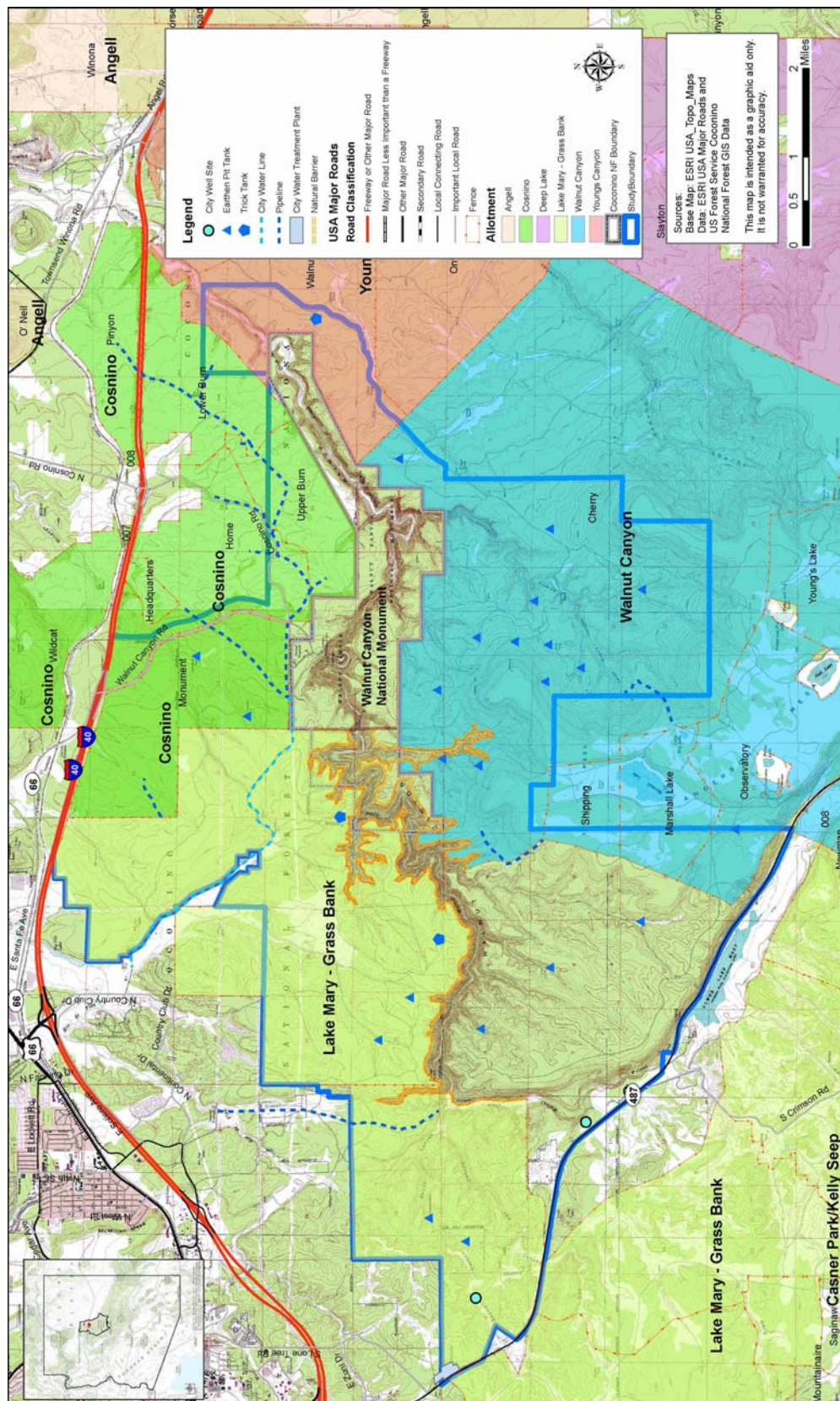


FIGURE 5. GRAZING ALLOTMENTS

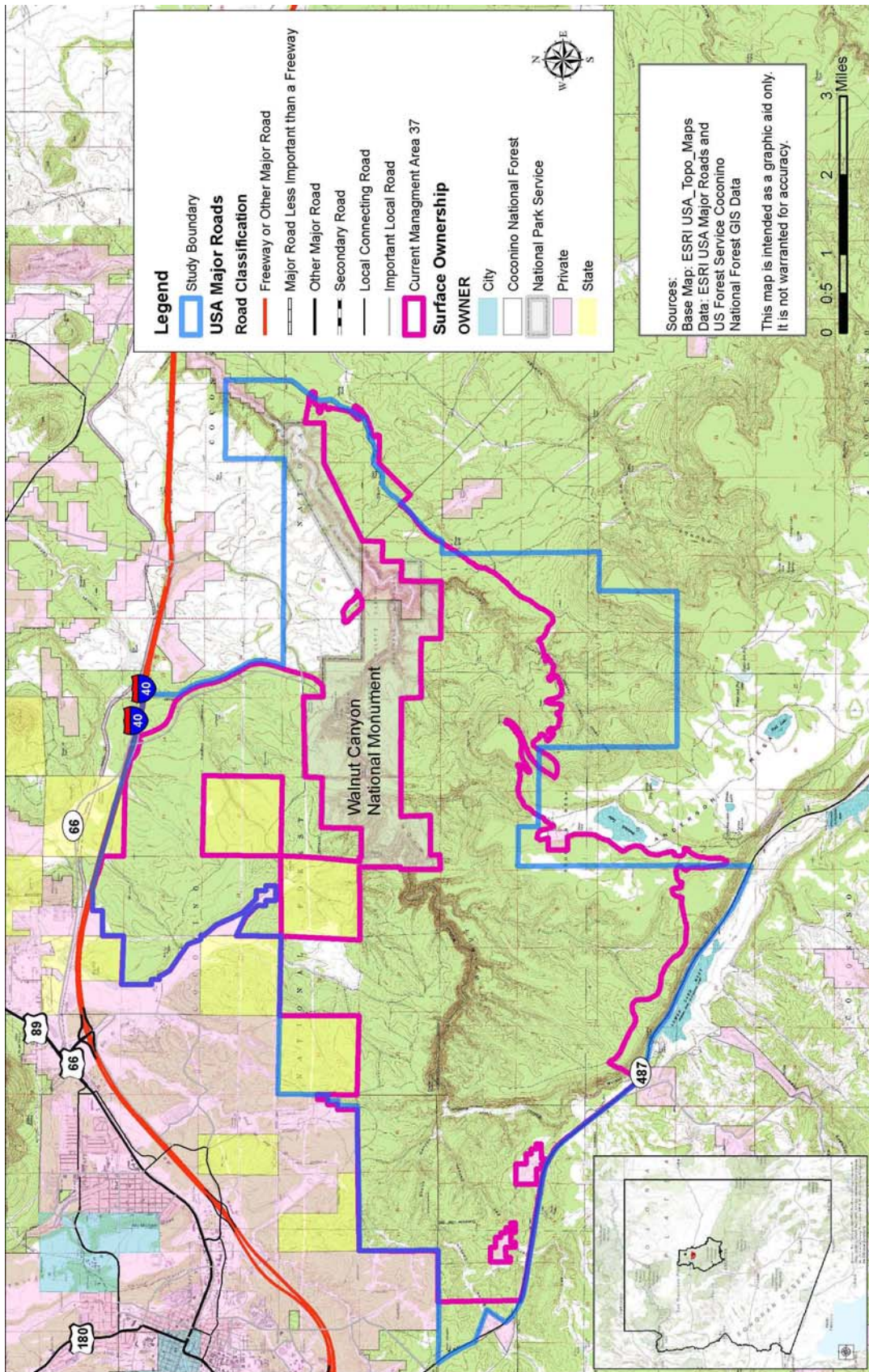


FIGURE 6. CURRENT MANAGEMENT AREA 37

Legislation establishing special management areas asserts the importance of the area. While most acts creating special management areas express similar purposes for designation, there are subtle differences between specific designations. For example, preservation of scenic and natural resources is prioritized in the designation of scenic and other protected areas. Recreation is protected, but not prioritized. On the other hand, legislation setting aside recreation areas usually includes specific provisions to protect appropriate recreational uses within the area while also asserting resource protections. Most of the focus in the legislation is to consolidate lands within the special management area. An area-specific land management plan may outline the circumstances for retention or exchange of land within or adjacent to the special management area.

A National Conservation Area (NCA) is a BLM designation for lands that feature “exceptional scientific, cultural, ecological, historical, and recreational values.” The first National Conservation Area was established in California in 1970 (Kings Mountain NCA). Currently there are 16 National Conservation Areas. Most are in the West (Alaska, California, Utah, Nevada, Colorado, Arizona, New Mexico, and Idaho), including four established in 2009.

Legislation establishing a National Conservation Area typically defines a site’s core values and general management guidelines. For example, recent National Conservation Areas have been established to protect “cultural, economic, ecological, and social health” of the Steens Mountain area in Oregon and “protect, conserve, and enhance the unique and nationally important historic, cultural, scientific, archeological, natural, and educational resources” of caves in Lincoln County, New Mexico.

There is precedent for Congress establishing National Conservation Areas with a provision that federal lands not be exchanged or subdivided unless such an action will serve the public interest. The legislation establishing

Steese National Conservation Area in Alaska, for example, specifies that “no public lands within the national conservation area shall be transferred out of Federal ownership except by exchange pursuant to §206 of the Federal Land Policy and Management Act.” Public Law 96-487, Title IV Section 402 (b), Section 206 of the Federal Land Policy and Management Act, however, provides considerable leeway for determining “public interest,” including community expansion. Nonetheless, there does not appear to be any reason that Congress cannot include a stronger proscription on land exchanges.

Many National Conservation Areas encompass wilderness (including Red Cliffs and Beaver Dam Wash, Utah; El Malpais, New Mexico; and Sloan Canyon, Nevada). Extant recreation and grazing activities however are protected in all National Conservation Areas, when such uses do not undermine the purposes for which the National Conservation Area was established.

While all established National Conservation Areas have been primarily on BLM-managed lands, there are National Conservation Areas that contain National Park Service (El Malpais, New Mexico; Gunnison Gorge, Colorado), U.S. Forest Service (Red Cliffs, Utah), and other federal lands (Snake River Birds of Prey National Conservation Area, Idaho). Almost all National Conservation Areas encompass some nonfederal lands. Legislation establishing most National Conservation Areas stresses that they are to be managed cooperatively with applicable federal, state, and local agencies and/or be advised by an interagency advisory panel.

There does not appear to be a regulatory or legislative prohibition preventing Congress from establishing a National Conservation Area encompassing primarily USFS lands. Based on public input to conserve and preserve the natural environment and maintain existing recreational activities, the most appropriate special management designations for the lands considered in this

Study Area are “National Conservation Area” or “National Scenic Area.”

Option 3: Congressional Restriction on Exchange of Lands

Congress could write legislation for focused specifications for land management, i.e., restriction on land disposal. No concrete examples for this scenario were discovered during the research phase of this study. Under this scenario, it is assumed that the U.S. Forest Service would continue to manage the land as described under option 1.

NONFEDERAL LANDS IN THE STUDY AREA

The Study Area includes Arizona trust lands and other private lands and inholdings. Because the act did not suggest acquisition of additional lands, management options couldn't be incumbent on the acquisition of nonfederal lands, nor could such acquisition be factored into the evaluation. Therefore, the options presented above would not be applied to private lands or Arizona State Trust lands unless these lands are acquired by the federal government.

Arizona State Trust Lands

The Arizona State Land Department is the trustee for over 9 million acres of state trust land. Its mission is to provide management to maximize revenues for 13 beneficiaries—a responsibility that distinguishes Arizona State Land Department management and land use from permitted use of public land such as parks or national forests. While public use of state trust land is not prohibited, it is regulated to ensure compensation to the beneficiaries for use and land protection. The value of state trust land is established by appraisal and approved by the State Land Department Board of Appeals. The Arizona State Land Department would work cooperatively with the federal government for acquisition of state trust land and to reach an agreement on the

appraised value. The Arizona State Land Department is also working with the City of Flagstaff Regional Plan to address proposed land use on state lands.

Arizona State Trust Lands within Study Area Boundary – Sections 22 and 28. The Arizona State Land Department has acknowledged that sections 22 and 28 are appropriate for acquisition by the federal government due to the conservation value and a low likelihood for development. Because the congressional legislation did not indicate an intent or disposition to direct procurement, that option was not explored as part of this study. Furthermore, the location, resource values, and access of these lands led the study group to determine that their inclusion or exclusion would not substantively alter the assessment of the management options, e.g., a low likelihood of significant cultural and natural resources that would support NPS management.

Arizona State Trust Lands Adjacent to and within the Study Area Boundary – Sections 20, 30, and 10. Section 20 (adjacent to the Study Area), section 30 (within the Study Area) and section 10 (north of I-40, outside the Study Area) are viable for development. The Arizona State Land Department and the City of Flagstaff are working cooperatively on the regional plan update to address land uses, including open space, on state trust land. The Arizona State Land Department considers a buffer zone on the east and south sides of sections 20 and 30 as a viable condition of sale for development. The Arizona State Land Department also would consider designating the area in section 10, south of I-40 as open space subject to density considerations in subsequent general plan / zoning actions.

Given current pressures on budgets and the location of these lands relative to existing Monument boundaries, acquisition through purchase of these lands by the U.S. Forest Service is not considered a foreseeable option. Proposition 119 – Arizona State Trust Land Amendment, passed November 2012, could allow the exchange of Arizona state lands to the federal government

(<http://www.azsos.gov/election/2012/Info/PubPamphlet/english/Prop119.htm>). At this time, however, there are no policies on how this legislation will be implemented. Since the Arizona State lands are not within the legislative boundaries of the Monument, purchase or exchange would not occur with the National Park Service, however, a land exchange may be possible with the U.S. Forest Service in the future.

None of the options or management strategies presented in this report would be directly applicable to the Arizona State Trust Lands. For example, the Coconino National Forest Transportation Management Plan addressing road closures does not apply to state trust lands. If the Study Area were to receive a special management designation, it would not include state trust lands. Options, land and resource management strategies and designation, and federal agency policies may apply to these lands when and if they are transferred to federal agency management.

Options for Private Inholdings

None of the management options presented earlier in this report would be directly applicable to the private land, surface or mineral inholdings within the Study Area. Options, land and resource management

strategies and plans, and federal agency policies would only apply to these lands if they were acquired and became subject to federal management.

Ownership of land and mineral rights in Arizona and its related mineral entry status is complex. The complex nature of land and mineral entry status is further complicated by the fact that the surface and mineral rights on many parcels are under separate ownership. Detailed information on land, mineral rights, and water rights title data are available in a booklet entitled *Manual for Determination of Status and Ownership, Arizona Mineral and Water Rights*. Detailed information on acquiring mining rights is given in *Laws and Regulations Governing Mineral Rights in Arizona*. Both booklets are available from the Arizona Department of Mines and Mineral Resources, 1502 West Washington, Phoenix, Arizona 85007.

Mineral rights can be obtained on state or federal lands that are open to mineral entry. Mining claims, leases, and mineral material sales apply to federal lands while prospecting permits, leases, and material sales apply to state trust land (ADMMR 2012). Information concerning mineral rights and mining claims can be accessed online at: <http://mines.az.gov/info/mineralrights.html>.



Cliff Dwelling

THIS PAGE INTENTIONALLY LEFT BLANK

CULTURAL AND NATURAL RESOURCES

Throughout the study and during the public involvement periods, certain resources were identified by the public as important aspects to consider for this special study. This section provides a brief description of those resources, but not an exhaustive discussion of all resources of the area.

GENERAL

The Study Area is within the southern portion of the Colorado Plateau biotic province; within the Mogollon Highlands-Coconino Plateau region surrounding the Study Area, elevations vary from 2,400 feet msl at the bottom of the Grand Canyon to 12,670 feet above msl at the crest of the San Francisco Peaks (NPS 2007). The region has been shaped by erosion to expose geologic outcrops of red sandstone and white limestone. The Study Area surrounding the Monument is also characterized by an extensive volcanic field, the San Francisco Volcanic Field, which includes the basalt-capped Anderson Mesa and some cinder deposits. Soil types vary within the Study Area depending on whether they are derived from weathered limestone, sandstone, shale, cinders, or volcanic bedrock.

The Study Area lies within a semiarid, continental climate typified by a moderately hot and moist summer, cool and dry spring and fall, and cold, periodically wet, winter (Hansen et al. 2004). Monsoon-like precipitation events, often in the form of violent thunderstorms, occur principally from July through September. The regional climate varies with elevation above msl. The Monument (6,900 feet [2,103 meters [m]] msl elevation) receives approximately 18 inches (45.7 centimeters [cm]) of precipitation per year, and temperatures typically range from near 0 degrees Fahrenheit (°F) in winter to mid-90°F in summer. Thirty miles to the northeast, the Little Colorado River basin at

4,500 feet (1,372 m) msl elevation typically receives fewer than 7.0 inches (17.8 cm) of precipitation per year. Winter daytime temperatures are typically 10°F to 15°F warmer than Flagstaff—summer temperatures often exceed 100°F. Above 10,000 feet (3,048 m) msl elevation on the adjacent San Francisco Peaks, annual precipitation exceeds 40.0 inches (101.6 cm), temperatures are considerably cooler, and the growing season is remarkably shorter (NPS 2007).

Climate records from the Monument and applicable to the Study Area have been recorded since 1910 (WRCC 2012) (accessed online at <http://www.wrcc.dri.edu/>). As summarized by Neff et al. (2011), the mean annual temperature for the Study Area is approximately 50.3°F, while the mean of the average monthly maximum temperatures is 65°F. The mean of the average monthly minimum temperatures is approximately 35.7°F. The hottest month is July, with a mean of 72.4°F. The coldest months are January and December, both averaging 31.8°F. Neff et al. (2011) determined that all of the high monthly extreme temperatures have occurred in the past decade, with the exception of December 1910.

Precipitation data recorded within the Monument establish the mean annual precipitation total of 18.12 inches (46.0 cm). There is a bimodal precipitation pattern, with the summer season receiving an average of 5.52 inches (14.0 cm) and the winter season precipitation averaging 4.93 inches (12.5 cm); the highest monthly average precipitation occurs in August in response to monsoon weather patterns and the lowest average precipitation occurs in June. Snowfall during the 1972–1973 winter season was 129.0 inches (327.7 cm)—the deepest on record. Recently, the 2009–2010 season recorded 100 inches (254 cm) of snow within the Monument;

average annual snowfall is 55 inches (140 cm) (WRCC 2012).

CULTURAL RESOURCES

Archeological Resources

The Coconino National Forest land surrounding the Monument contains thousands of archeological sites. Most of the sites and associated artifacts are the physical remains of a prehistoric farming culture that flourished in what is now the Flagstaff region from about AD 600 until AD 1400. This culture is referred to by archeologists as “Sinagua” in reference to the early Spanish name for the highland region “Sierra Sinagua” meaning a mountain range without water (NPS 2007). Sinagua families cultivated the Study Area uplands around Walnut Canyon for centuries growing primarily small gardens of corn, squash, and beans. The Sinagua lived in subterranean pit structures initially, but by the early 1100s most habitations included at least some aboveground structures. During the 1100s in the Walnut Canyon area, there was also a notable shift toward living in cliff alcoves (NPS 2007).

By the mid-1100s, a large segment of the local Sinagua population moved into the limestone alcoves below the canyon rim, constructing substantial dwellings with locally available stone and clay. The Walnut Canyon community thrived for about 150 years, growing crops on scattered plots in the surrounding forest, raising children, making stone tools and other implements, and likely following the ancient ceremonial cycles that had been passed down for generations (NPS 2007).

The Sinagua population in the Flagstaff region peaked in the mid-1100s through the early 1200s, coincident with the peak occupation of Walnut Canyon, but declined precipitously in the following century. By the early 1300s, the Sinaguas had moved out of Walnut Canyon, presumably to Anderson Mesa or farther south and east; their descendants continued to

visit the area for hunting, gathering, and ceremonial purposes. During the following centuries, the area around Walnut Canyon was visited by ancestors of the Yavapais and Havasupais, and after the 1700s by Apaches and Navajos for seasonal hunting and gathering activities (NPS 2007).

Archeological surveys had previously been conducted on 12, 815 acres of the Study Area. An archeological inventory was conducted on a 734-acre portion of the Study Area in 2010/2011 (Neff et al. 2011). The recent inventory included four survey areas; one survey in the west portion of the canyon, and three areas to the west of the entrance road. The survey team recorded or re-recorded 68 sites and 72 components (Neff et al. 2011). Analysis of the newly recorded sites and an additional 3,015 Sinagua sites in a 292,552-acre area surrounding the Monument documents several archeological surveys near the Monument including large areas to the south and additional areas to the west. The evaluation found the majority of known sites to be east and north of the Monument. The report concludes that the sites within the Study Area do not form a coherent cluster associated with the Elden Phase Walnut Canyon Village cluster in the Monument and that the sites do not meet the criteria to be individually or collectively eligible for national historic landmark status thus not nationally significant (Neff et al. 2011).

Ethnographic Resources

The Study Area is part of a region lying between extensive high-altitude national forest lands to the southwest and semidesert mesas of the Hopi and Navajo reservations to the northeast; the reservations represent the largest block of American Indian tribal lands in the United States (more than 25,000 square miles). These contemporary reservations represent a small portion of the land occupied aboriginally and historically by the tribes and to which the tribes retain deeply rooted traditional associations. The three Flagstaff

Area National Monuments (Walnut Canyon, Wupatki, and Sunset Crater Volcano) are an integral part of this larger traditional landscape (NPS 2007).

Within the three monuments many geographic features and natural and cultural resources identified by the tribes as culturally significant are historically or ceremonially interconnected with other landscape features and archeological sites throughout the tribes' entire customary land base. In addition to the Hopi and Navajo tribes, who currently occupy the tribal lands adjacent or near the monuments, many of the other tribes originally consulted by the National Park Service retain customary associations with many of the same resources and places throughout the region (NPS 2007).

The literature documents up to 13 tribes who claim cultural associations with lands within the Monument, including the White Mountain Apache Tribe, Yavapai-Apache Nation, Zuni Tribe, Yavapai-Prescott Tribe, Hualapai Tribe, Havasupai Tribe, Hopi Tribe, Kaibab Band of Paiute Indians, Navajo Nation, San Carlos Apache Tribe, San Juan Southern Paiute Tribe, Tonto Apache Tribe, and Fort McDowell Yavapai Nation. Six groups, including Navajos, Hopis, Apaches, Paiutes, Zunis, and Pais, were involved in an ethnographic study in 2004 by Toupal and Stoffle. All six groups identified plants and the ruins as culturally significant. Plants are the primary resource of concern; however, wildlife, minerals, the ruins, and other signs of previous use are important as well. Traditional uses of the area centered on ceremonial activities including star observation, spiritual experiences and teachings, plant gathering, hunting, and farming (Toupal 2004).

The Hopi, Zuni, and Navajo tribes conducted field research to identify ethnographic resources within the Monument. The Navajo Nation has identified 14 culturally significant plant species within Walnut Canyon, in addition to white clay, a culturally significant mineral. The Hopi Tribe and Pueblo of Zuni identified the archeological resources in

Walnut Canyon, including pre-Columbian architectural remains and petroglyphs, as part of their traditional histories and contemporary cultural identities (NPS 2007).

The Study Area has not been surveyed for ethnographic resources. However, the existence of so many ethnographic resources within the Monument boundary and the number of recorded archeological resources within the Study Area indicates that there is a high probability for ethnographic resources within the Study Area.

NATURAL RESOURCES

Wildlife, Ecosystem, and Wildlife Habitats

The Study Area provides important wildlife habitats and migration corridors that have remained relatively undisturbed under historic regional management plans and applications (NPS 2007). The relative lack of disturbance is largely attributed to the ruggedness of the canyon terrain, characteristic vegetation cover, and reliable precipitation. The long-term closure of the backcountry area within the Monument has also minimized human presence and noise disturbance to a variety of wildlife species. Observations by the National Park Service, Arizona Game and Fish Department, and USFS biologists and managers confirm that Walnut Canyon is a locally important wildlife habitat and movement corridor for elk, pronghorn, mule deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), and Merriam's (wild) turkey (*Meleagris gallopavo*).

The proximity of the Study Area to suburban development is of management concern; however, large mammals are diverse and occasional-to-common, including mountain lion (*Puma concolor*), black bear, elk, and mule deer in the canyons and surrounding forest/woodland habitats. Collared peccaries or javelina (*Pecari tajacu*) are uncommon and important because the Study Area represents the northern edge of their range. Common to

abundant small-to-medium-sized mammals include Abert's or tassel-eared squirrel (*Sciurus aberti*), gray-collared chipmunk (*Tamias cinereicollis*), little brown myotis bat (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), deer mouse, brush mouse, and pinyon mouse (*Peromyscus maniculatus*, *P. boylii*, and *P. truei*), Stephens' woodrat (*Neotoma stephensi*), porcupine (*Erethizon dorsatum*), ringtail (*Bassariscus astutus*), hog-nosed skunk (*Conepatus mesoleucus*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*). A small number of pronghorn inhabit Coconino National Forest lands adjacent to the northeastern and southeastern boundary of the Monument (NPS 2007). Domestic cattle graze on U.S. Forest Service and Arizona State Trust lands of the Study Area, as permitted.

The Study Area supports a variety of raptors including the winter migrant bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), northern goshawk (*Accipiter gentilis*), peregrine falcon (*Falco peregrinus*), Mexican spotted owl (*Strix occidentalis*), turkey vulture (*Cathartes aura*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*A. cooperii*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), prairie falcon (*F. mexicanus*), flammulated owl (*Otus flammeolus*), and great horned owl (*Bubo virginianus*). Birds that are common to several area habitats include the wild turkey, band-tailed pigeon (*Columba fasciata*), and common raven (*Corvus corax*). Birds characteristic of the coniferous forest/woodland and canyon habitats include Lewis' woodpecker (*Melanerpes lewis*), pinyon jay (*Gymnorhinus cyanocephalus*), Steller's jay (*Cyanocitta stelleri*), pygmy nuthatch (*Sitta pygmaea*), black-throated gray warbler (*Dendroica nigrescens*), Grace's warbler (*D. graciae*), red-faced warbler (*Cardellina rubrifrons*), mourning dove (*Zenaida macroura*), northern flicker (*Colaptes auratus*), hairy woodpecker (*Picoides villosus*), western wood-pewee (*Contopus sordidulus*), ash-throated flycatcher (*Myiarchus cinerascens*), violet-green swallow (*Tachycineta thalassina*), mountain chickadee

(*Poecile gambeli*), rock wren (*Salpinctes obsoletus*), and canyon wren (*Catherpes mexicanus*).

Amphibians are uncommon within the Study Area because of the general scarcity of surface water and wetland habitat.

Generally, vegetation of the Study Area is diverse and ecotonal in species composition (Hansen et al. 2004). It ranges from low elevation grasslands to high elevation woodland and forest communities. Tree species that often intermix (are codominant) in the habitats (on other areas on the Colorado Plateau these species are dominant on the landscape) and form a broad transition zone include pinyon pine (*Pinus edulis*), Gambel oak (*Quercus gambelii*), Utah juniper (*Juniperus osteosperma*), and ponderosa pine (*Pinus ponderosa*). High elevation species, riparian obligates, and more mesic species occur in abundance due to north-facing slopes and mesic canyon walls and canyon bottoms. These mesic and cooler environments support species that typically occur at higher elevations such as dense patches of Rocky Mountain juniper (*Juniperus scopulorum*), Douglas-fir (*Pseudotsuga menziesii*), and New Mexican locust (*Robinia neomexicana*). The canyon floor supports a diverse community with the overstory composed mainly of deciduous trees and shrubs, primarily box-elder (*Acer negundo*), dogwood (*Cornus stolonifera*), New Mexican olive (*Forestiera pubescens*), Arizona walnut (*Juglans major*), New Mexican locust (*Robinia neomexicana*), Arizona rose (*Rosa arizonica*), and snowberry (*Symphoricarpos rotundifolius*).

Woodlands are the most common vegetation type in the Study Area and range from dense stands of trees on north-facing canyon walls, canyon bottoms, and in fire-suppressed areas to open stands of sparse trees in meadow-like areas. The most common trees in the upland environments of mid- to high-elevations are ponderosa pine in Black Canyon NP and Curecanti NRA and pinyon pine and Utah juniper occurring mainly on the mid- to low-

elevation sites. In the early 1900s, large ponderosa pine trees were logged and the natural fire regime was altered, allowing ponderosa pine to regenerate quickly and change the vegetation community from open meadows with low densities of ponderosa pine to areas of high density of ponderosa pine with a sparse understory community (Covington and Moore 1994). Much of the Study Area supports a dense ponderosa pine stand structure due to these activities; however, some larger ponderosa pines have withstood these management activities. In the more mesic areas, Douglas-fir (*Pseudotsuga menziesii*) and Rocky Mountain juniper are the most common tree species, occurring in forest vegetation types or stands. A wide range of tree species occur in smaller patches in the linear corridors of the canyon bottom, including willow, box-elder, narrowleaf cottonwood (*Populus angustifolia*), and Arizona walnut. Many of these tree species are restricted to mesic sites and require intermittent water flow. These community types typically have high cover and diversity of shrubs and understory species due to the additional water flow and moist soils. Riparian obligate species include sedges (*Carex* sp.) and willows, among others.

Potential Important Ecological Sites

Three local plant assemblages were identified as being unique to the Study Area (Hansen et al. 2004); these assemblages require further sampling on the Colorado Plateau to determine if they represent local vegetation types unique to the Study Area and possibly considered ecologically critical or if they are more widely distributed across the landscape. The assemblages are: (1) *Chamaebatiaria millefolium* – *Forestiera pubescens* Shrubland (Fernbush – New Mexico Privet Shrubland); (2) *Acer negundo* / *Forestiera pubescens* – *Symphoricarpos rotundifolius* Temporarily Flooded Shrubland (Box-elder – New Mexico Privet – Roundleaf Snowberry Temporarily Flooded Shrubland); and (3) *Ericameria nauseosa* – *Gutierrezia sarothrae* Shrubland

(Rubber Rabbitbrush – Snakeweed Shrubland).

Of the regional rare plant species, several are endemic to the Mogollon Highlands and San Francisco Mountains and their habitat may be considered under ecological critical areas. Included are the San Francisco Peaks groundsel (*Senecio franciscianus*), listed as federally threatened and occurring above timberline, and Bebb's willow (*Salix bebbiana*). The Sunset Crater penstemon (*Penstemon clutei*) and cinder lady's tresses (*Phacelia welshii*) are endemic to the volcanic cinder deposits surrounding the San Francisco volcanic field. Riparian areas support numerous plant species of concern, such as Navajo sedge (*Carex specuicola*) and alkali grass (*Puccinella parishii*), which occur at lower elevations in wetter sites north of the Little Colorado River, and alcove bog orchid (*Platanthera zothecina*). A number of species inhabit ponderosa pine forests and may depend on fire to maintain an open forest canopy so that sunlight penetrates to the ground. Many species within the cactus family occupy specific habitats and are sensitive to disturbance, including livestock grazing. Because of their popularity with horticulturists, all native cactus species within Arizona are protected under state law (NPS 2007). The U.S. Forest Service conducts surveys on an as-needed basis for specific projects.

Invasive Species

The spread of invasive species is recognized as one of the major factors contributing to ecosystem change and instability throughout the world (NPS 2007). An invasive species is “a nonnative species whose introduction does, or is likely to cause, economic or environmental harm or harm to human, animal, or plant health” (Executive Order 13112, 1999). Invasive species may include all organisms ranging from microscopic insects to large mammals, which can invade any ecosystem. These species have the ability to displace or eradicate native species, alter fire regimes, damage infrastructure, and threaten

human livelihoods. Almost all national park system units have incorporated invasive species management into long-range planning goals for natural and cultural landscapes, as well as day-to-day operations.

At least 31 species of noxious plants, invasive plant species, and nonnative plants have become dispersed into the Study Area (table 1). Noxious plants are invasive, mostly nonnative species identified by the U.S. Department of Agriculture and the State of Arizona to be of particular concern (CCCP 2012). Invasive, nonnative plants must be addressed on a parcel-by-parcel and large-scale basis by land management agencies, roadway maintenance staff, private property owners, and developers. Coconino County policies focused on noxious and invasive plant species, include: (1) promoting the protection of threatened and endangered vegetation species and encouraging the preservation of native, noninvasive vegetation and retention of other significant vegetation features for all new development proposals; (2) to the extent possible, revegetation and restoration of

disturbed areas with native species shall be required; and (3) Coconino County shall require appropriate action to prevent the spread of noxious plants prior to implementation of a development project or roadway maintenance.

Nonnative species may rapidly colonize areas where the ground surface is heavily disturbed by equipment, constant foot traffic, burning, burrowing small mammal activity, etc. Within the Study Area, stands and populations of cheatgrass (*Bromus tectorum*), mullein (*Verbascum thapsus*), filaree (*Erodium cicutarium*), common horehound (*Marrubium vulgare*), and Dalmation toadflax (*Linaria dalmatica*) have infested disturbed areas along road and trail corridors, developed areas, areas of heavy visitation, or prairie dog towns. Although these species are commonly observed, the National Park Service conducts limited, yet annual treatment, mainly in the visitor use areas. Coconino National Forest conducts annual noxious weed control programs in the Study Area and treats when located.

TABLE 1. WALNUT CANYON NATIONAL MONUMENT VICINITY NONNATIVE AND INVASIVE PLANT SPECIES

Scientific Name	Common Name
<i>Agropyron desertorum</i>	desert wheatgrass
<i>Bassia scoparia</i>	Kochia
<i>Bromus rubens</i>	red brome
<i>Bromus tectorum</i>	cheatgrass
<i>Centaurea diffusa</i>	diffuse knapweed
<i>Centaurea maculosa</i>	spotted knapweed
<i>Centaurea solstitialis</i>	yellow star-thistle
<i>Centaurea virgata</i>	squarrose knapweed
<i>Cirsium vulgare</i>	bull thistle
<i>Convolvulus arvensis</i>	field bindweed
<i>Dactylis glomerata</i>	orchardgrass
<i>Descurainia sophia</i>	herb sophia
<i>Elaeagnus angustifolia</i>	Russian-olive
<i>Eragrostis lehmanniana</i>	Lehmann lovegrass
<i>Erodium cicutarium</i>	redstem stork's bill

TABLE 1. WALNUT CANYON NATIONAL MONUMENT VICINITY NONNATIVE AND INVASIVE PLANT SPECIES

Scientific Name	Common Name
<i>Euphorbia esula</i>	leafy spurge
<i>Lactuca serriola</i>	prickly lettuce
<i>Linaria genistifolia</i>	Dalmatian toadflax
<i>Malva neglecta</i>	common mallow
<i>Marrubium vulgare</i>	common horehound
<i>Medicago sativa</i>	alfalfa
<i>Melilotus officinalis</i>	yellow sweetclover
<i>Onopordum acanthium</i>	Scotch thistle
<i>Plantago lanceolata</i>	narrowleaf plantain
<i>Polygonum aviculare</i>	prostrate knotweed
<i>Portulaca oleracea</i>	little hogweed
<i>Salsola tragus</i>	prickly Russian thistle
<i>Tamarix</i> spp.	salt-cedar, tamarisk
<i>Tragopogon dubius</i>	yellow salsify
<i>Verbascum thapsus</i>	common mullein
<i>Verbena bracteata</i>	bigbract verbena

Source: Hansen et al. 2004; USFS 2012; San Francisco Peaks Weed Management Area 2012

Success in controlling invasive plants is predicated on early detection of infestations before they become established across the landscape and on the availability of ecologically sound and affordable technology. The best measures to control these plant species are proactive planning of access routes and ground-disturbing activities to minimize the potential for establishment and spread. USFS management of the Walnut Canyon watershed has the greatest potential to affect natural systems and processes within the Monument. The U.S. Forest Service provided noxious weed control in various locations, including the Study Area, in Coconino National Forest each year to improved habitat for native plants and animals by removing nonnative plant competition, and improved native community resiliency for all species including threatened, endangered, and sensitive plants and animals (USFS 2010). The National Park Service addresses interagency concerns through monitoring ecosystem

conditions and participating in the USFS planning process.

Old-growth Ponderosa Pine Forest Stands

Stands of mature forest and woodland types within the Study Area include associations of Douglas-fir (mesic slopes within canyons and on canyon floor sites), ponderosa pine, and pinyon pine sampled and described for the Monument and adjacent Study Area (Hansen et al. 2004). Within Coconino National Forest, existing and potential old growth is evaluated at the project level to provide habitat; there are approximately 2,042 acres of developing old growth and 648 acres of existing old growth in the Study Area (USFS 2010).

During sampling to create the vegetation classification, the largest ponderosa pine tree measured 52 inches (132 cm) diameter-breast-height. In the early 1900s, large ponderosa

pine trees were logged and the natural fire regime was altered, allowing ponderosa pine to regenerate quickly and change the vegetation community from open meadows with low densities of ponderosa pine to areas of high density ponderosa pine with a sparse understory community (Covington and Moore 1994). Much of the Monument supports a dense ponderosa pine stand structure due to historic logging activities; some ponderosa pines remain.

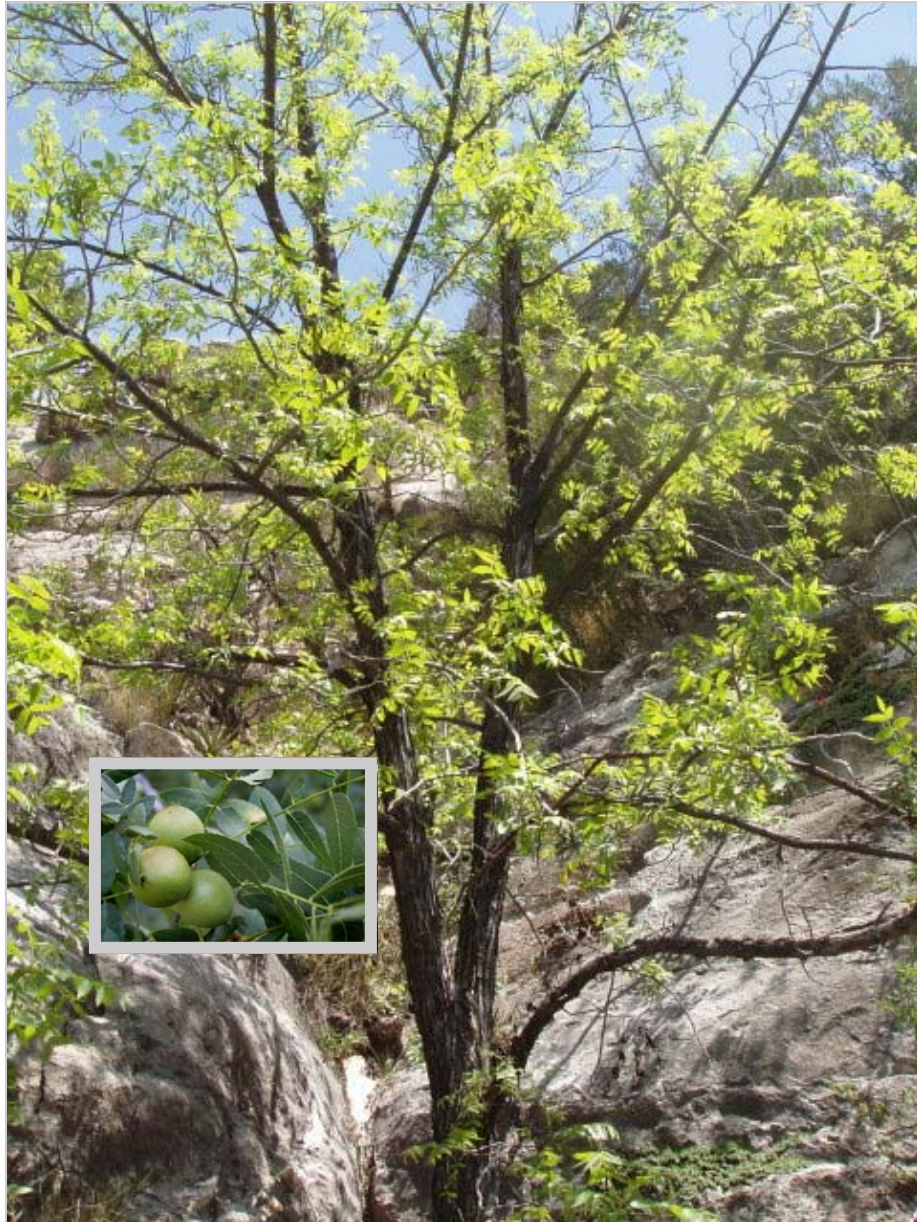
Threatened and Endangered Species and Species of Special Concern

Old-growth coniferous forests and woodlands, shrublands, and herbaceous vegetation communities in the region, combined with physiographic features including canyons, cliffs, bluffs, and mountains, provide habitat for a number of threatened, endangered, and sensitive species. The Arizona Heritage Data Management System (AGFD 2012b) was consulted via the Internet to generate a list of threatened and endangered species, and other species of concern for Coconino County, Arizona. Within Coconino County, there are six plant, nine animal (including fish), and one invertebrate species that are formally listed as threatened or endangered. There are another 54 plant, 51 animal (including fish), and 5 invertebrate species that may be exceedingly rare and are being monitored by the U.S. Fish and Wildlife Service, Arizona Game and Fish Department, U.S. Forest Service, the National Park Service, and Navajo Natural Heritage Program (AGFD 2012). The U.S. Forest Service does not officially monitor for species in the study area; however, Northern Arizona University students have monitored for species over the years.

Many rare, threatened, and endangered plant, vertebrate animal, and invertebrate species require perennial streams, wetlands, or riparian habitats, which are uncommon in the Study Area. Most of these habitats have been altered for urban or livestock water supply

and forage production (Hansen et al. 2004). On grazing allotments that support threatened or endangered species and their habitat, mitigation measures are required and may include: (1) livestock management activities such as salting, herding, and construction actions associated with grazing operations within the allotment (fencing, etc.), which will not occur within a certain distance of roosts, nest sites, den sites, etc.; (2) monitor grazing use in specified habitats by cattle and wildlife; (3) follow best management practices associated with watershed protection; and (4) specified placement and management of salt, mineral block, or supplements (USFS 2012).

Plants. The Study Area supports eight sensitive plant species habitats determined following the comparison with summary floristic checklists compiled by the National Park Service (2001) and Hansen et al. (2004). In addition, a survey for special status plant individuals and populations within the Flagstaff Area National Monuments, including Walnut Canyon, was completed by Huisinga and others (2000). Currently, no federally listed threatened or endangered plant species are known to occur in the Monument (NPS 2007). Coconino National Forest monitors several sensitive plant species and an agreement was established between Coconino National Forest and the Arboretum at Flagstaff to update a management plan in the Verde Valley for an area with a number of sensitive plant species (USFS 2010). The plant species of concern that are known to be in the Study Area includes Flagstaff false pennyroyal (*Hedeoma diffusum*). Other species of special concern that may occur in the Study Area include Arizona bugbane (*Actaea [Cimicifuga] arizonica*), Arizona leather-flower (*Clematis hirsutissima* var. *arizonica*), Chiricahua (Blumer's) dock (*Rumex orthoneurus*), Arizona (desert) columbine (*Aquilegia desertorum*), rock fleabane (*Erigeron saxatilis*), Rusby milkvetch (*Astragalus rusbyi*), and Arizona cliffrose (*Purshia subintegra*).



Arizona Black Walnut

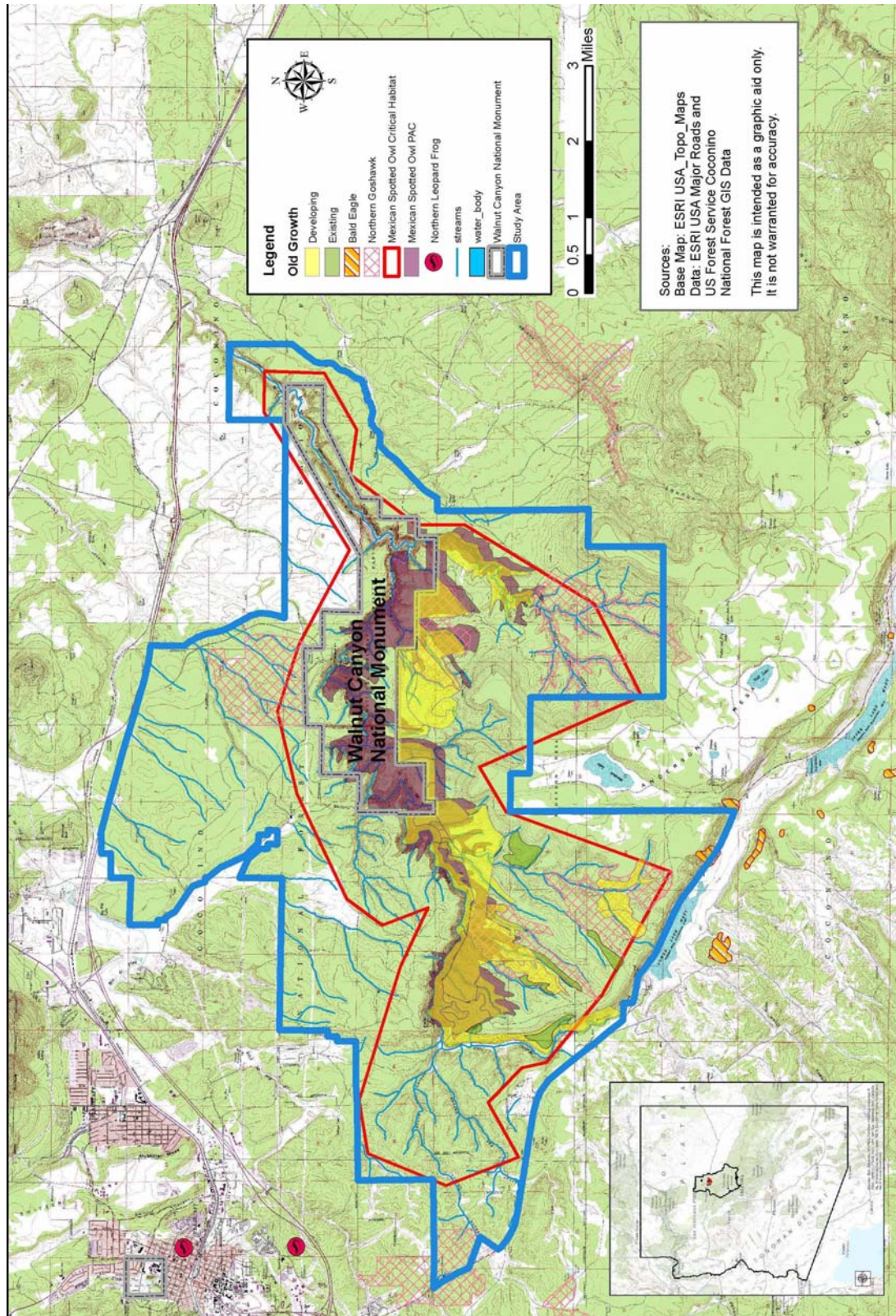


FIGURE 7. SENSITIVE SPECIES

Birds. The Mexican spotted owl (*Strix occidentalis lucida*) is listed as threatened under the Endangered Species Act, ranked G3T3/S3S4, is considered vulnerable under the NatureServe (2012) global/state ranking, and occurs as a breeding species within the Study Area, including Walnut Canyon and adjacent rim habitats. In southern Arizona and New Mexico, Mexican spotted owls use the mixed conifer, Madrean pine-oak, Arizona cypress, encinal oak woodlands, and associated riparian forests in addition to canyon habitat dominated by vertical-walled rocky cliffs within complex watersheds, including tributary side canyons. Canyon habitat may include small isolated patches or stringers of forested vegetation including stands of mixed-conifer, ponderosa pine, pine-oak, pinyon-juniper, and/or riparian vegetation in which Mexican spotted owls regularly roost and forage. Mexican spotted owls usually occur in areas with some type of water source (i.e., perennial stream, creeks, and springs, ephemeral water, small pools from runoff, reservoir emissions). Mated pairs are territorial and breeding season activity centers tend to be smaller than the nonbreeding season activity centers (with considerable overlap between the two). Adults may or may not leave the territory during the winter, and most adults remain in the same territory year after year. Actions that open up or remove mature or old-growth forests (timber harvest, wildfire, road or site construction that results in fragmentation of the forest) are detrimental to the local Mexican spotted owl population; human activity (hiking, shooting, off-road vehicle activity) in or near nesting, roosting, or foraging sites may result in abandonment of an area and indirectly may affect habitat parameters from trampling, vegetation removal, or increased fire risk.

Mexican spotted owl breeding activity has been monitored at various times between 1989 and 1998; the U.S. Fish and Wildlife Service recently designated the entire Monument as critical habitat for the species. The National Park Service is cooperating with the U.S. Fish and Wildlife Service and U.S. Forest Service to

implement the management actions identified in the Mexican spotted owl Recovery Plan (USFWS 1995). Specific actions include monitoring nesting activity and breeding success, protecting critical habitat from wildfire, and managing forest vegetation to conserve specific microhabitat attributes (NPS 2007). The Study Area contains five Mexican spotted owl protected activity centers.

The U.S. Forest Service limits activities in the protected activity centers during the breeding season and do not permit groups greater than 12 people. To date, the U.S. Forest Service has not determined season closures are needed in the area.



Mexican Spotted Owl

Bald eagles (*Haliaeetus leucocephalus*), previously listed as threatened (status is currently delisted due to recovery) under the Endangered Species Act, routinely occur during the winter in the Mogollon Highlands area. Although bald eagles are not known to regularly use winter roost sites within the Study Area, individuals are occasionally observed perching in dead tree snags and feeding on elk carrion. The nearest active bald eagle nesting sites are in the lower Lake Mary area within the Coconino National Forest; there are several regularly used winter roosting sites on forested lands (NPS 2007).

The peregrine falcon (*Falco peregrinus anatum*) is delisted due to recovery and occurs within Walnut Canyon and other portions of the Study Area. Peregrine falcons nest on steep cliff ledges and erosional features within the study region. Within the Monument, one known aerie is in the backcountry closure area; another occurs within the 1996 western boundary expansion area and is on a cliff that has been subject to recreational climbing activity historically. No NPS management activities, including visitor activities, are currently occurring or are proposed on or above cliffs known to support peregrine falcon aeries (NPS 2007).

The northern goshawk (*Accipiter gentilis*) is ranked G5/S3 and is considered secure under the NatureServe (2012) global/state ranking and uses habitats within the Study Area. Northern goshawks are relatively solitary raptors that prefer forest interior habitats and nest in a wide variety of forest types including deciduous, coniferous, and mixed forests, but typically nests in mature or old-growth forests and generally will select larger tracts of forest over smaller tracts. In the western United States, the northern goshawk characteristically nests in coniferous forests including those composed of ponderosa pine. The nests are generally in the largest trees of dense, mature stands with high canopy closure (60%–95%) and sparse ground cover near the bottom of moderate slopes and near water.

Forest-wide northern goshawk monitoring continued under a cost-share agreement with the Rocky Mountain Bird Observatory with 49 transects (grids) completed in habitats forest-wide. Vegetation data were collected at the beginning of each transect. No northern goshawks were detected. Additionally, the Flagstaff Ranger District conducted 15,655 acres of presence and absence surveys, but no northern goshawks were found. The amount of suitable habitat and population trends are managed at appropriate levels to prevent the northern goshawk from being listed as a threatened or endangered species (USDA/USFS 2010). There are six northern

goshawk post-fledging areas in the Study Area.

Mammals. The mountain lion (*Puma concolor*) is a year-round resident within habitats of the Study Area including Walnut Canyon. As a game species, a season is set by the Arizona Game and Fish Department in which hunting with use of dogs and other methods is allowed outside Monument boundaries (mostly on Coconino National Forest land) to licensed individuals. This species is of concern for the public and resource management agencies because it is a large predator with an important ecological role and with the potential to attack humans or pets on public lands within and around the Monument. Mountain lions have expansive home ranges that include the entire project area. The National Park Service currently has little information on the distribution and abundance of mountain lions within the Walnut Canyon area, but suspects the canyon provides good denning sites—they have been spotted in the Monument.



Mountain Lion

Bat species are considered to have specialized habitat requirements and sensitivity to environmental impacts. Thirteen bat species are listed as present or probably present in the Monument (NPSpecies Database 2011) and 12 species are currently monitored within Coconino County as species of concern. Old/mature trees, large dead snags, and the fractured limestone faces of Walnut Canyon

provide bat habitat. The National Park Service has little information on bat fauna, but is inventorying them within the Monument (NPS 2007).

On the Coconino National Forest, 20 sites were mist-netted to determine bat species composition (USFS 2010). At known and suspected roost sites, nine emergence counts were conducted (using infrared binoculars and infrared videography); five roosts were inspected for the presence of bat species. In total, 18 bat species were identified, of these, 3 species are sensitive, e.g., Allen's big-eared bat (*Idionycteris phyllotis*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), and western red bat (*Lasiurus blossevillii*).

Additional species of note present in the Study Area, although not threatened and endangered, include the golden eagle, deer, elk, and pronghorn.

The U.S. Forest Service has not completed site-specific surveys in the study area. Habitat is present for several sensitive bat species such as spotted bat (*Euderma maculatum*), Allen's lappet-browed bat (*Idionycteris phyllotis*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*) and western red bat (*Lasiurus blossevillii*). Studies have been conducted within Walnut Canyon National Park with several species documented (Drost 2009).

WATERSHED AND WATER RESOURCES

Surface water within the Study Area flows into the Little Colorado River watershed (Hydrologic Unit Code 15020015 – Canyon Diablo Drainage Area) (AZDEQ 2012). The Walnut Creek watershed (Hydrologic Unit Code 1502001502) encompasses approximately 124,160 acres (194 square miles) within the approximately 26,794-square-mile Canyon Diablo Drainage Area (USDA/NRCS 2011b). The headwaters of Walnut Creek occur in the Mormon

Mountain-Mormon Lake area more than 20 miles south of the Monument. Prior to 1900, the creek is believed to have ephemerally flowed through the bottom of Walnut Canyon on a bi-annual cycle driven by snowmelt and seasonal thunderstorm and monsoon rain activity.

The entire watershed is defined by the Little Colorado River from the headwaters to the Colorado River and tributaries to the San Juan River, which flow north and east into New Mexico and Utah. Elevations range from 12,600 feet on Humphreys Peak to 2,700 feet near the Colorado River; most of the watershed is above 5,000 feet elevation. The region is characterized by horizontally stratified sandstone and limestone that have eroded to form canyon and plateau landforms; in a few areas, igneous rocks have deposited on sedimentary formations due to volcanic activity (AZDEQ 2012). Land ownership is divided approximately as: 60% tribal, 12% federal, 12% private, and 6% state for the entire watershed and 92% U.S. Forest Service, 2% National Park Service, 5% private, and <1% Arizona State Trust Lands for the Walnut Creek watershed (USDA/NRCS 2011). The entire watershed is sparsely populated outside the City of Flagstaff (total of 236,500 people, 2000 census). Land use is primarily livestock grazing, forestry, recreation, and mining. The watershed supports four national monuments, four wilderness areas, and two national forests with varying levels of use restrictions (AZDEQ 2012).

The surface drainage patterns of the Study Area are directly related to the underlying geologic framework (Neff et al. 2011). North of Walnut Canyon, the dominant drainage direction is toward the north and northeast, away from the canyon. Only the area immediately along the rim drains into the canyon. To the west, the headwaters of Skunk and Fay canyons drain into Walnut Creek below Fisher Point. At some time in the past, perhaps prior to about 800,000 years ago, Walnut Creek did not flow through the Lake

Mary graben (linear feature that shows downward movement of bedrock relative to its sides), but more likely emanated from headwaters in Fay and Skunk canyons (Raucci et al. 2003). Walnut Canyon currently supports an intermittent drainage channel, but it likely flowed more often approximately 800 years ago during habitation by the Sinagua (Chronic 1988). Perennial pools likely occurred, as the steep canyon walls and riparian vegetation provided shade and the scoured bedrock created small depressions that could fill with water.

The upper watershed has been dammed to provide water for the City of Flagstaff, creating Upper and Lower Lake Mary (completed in 1905 and 1941 – elevated in 1952, respectively) (USFWS 2011). The lakes are situated in a faulted graben south of Anderson Mesa and capture a significant portion of the Walnut Creek flow / water volume, which results in less flow through the canyon within the Monument (Hansen et al. 2004). Water from Lake Mary reaches Walnut Canyon only when lake elevation exceeds the spillway elevation (Neff et al. 2011). Water draining into Lake Mary flows mostly from the southwest including the tributaries of Priest and Howard draws. A dense drainage network south of Walnut Canyon drains the western edge of Anderson Mesa, from about Fisher Point to the Monument boundary. A less-dense drainage network flows into Walnut Canyon downstream of the visitor center, draining the eastern edge of Anderson Mesa. The dominant trend of all Study Area drainages is toward the northeast, in the direction of the Painted Desert and the Little Colorado River.

Reliable flows typically occurred early each year during the period of spring snowmelt and less predictable flows likely occurred later each year during the summer and fall thunderstorm season (NPS 2007). The natural hydrology within the Walnut Canyon drainage was severely altered when the City of Flagstaff began impounding Walnut Creek for use as its public water supply, collected and stored in Upper Lake Mary. The dams

significantly disrupted seasonal water flows through the canyon; Walnut Creek ceased flowing. Since 1941, the canyon has flooded only a few times during extremely wet seasons, which completely filled both lakes. Flows of lesser magnitude occur about once a decade from smaller tributary watersheds below the lakes.

Small, internally drained basins that hold water year-around characterize the surface of Anderson Mesa; the largest is Marshall Lake (in the north-south trending Marshall Lake graben). This hydrologic process is thought to relate to extension of the Earth's crust as it is pulled apart along normal faults. This downward movement, which likely occurred millions of years ago, created linear valleys filled with alluvium eroded from upslope sources (Neff et al. 2011).

Watershed conditions of Coconino National Forest lands are monitored, regulated, and assessed to: (1) meet federal regulation; (2) ensure that forest watersheds are in satisfactory condition by 2020; (3) assure that the productivity of the land is maintained; (4) Watershed Condition Framework for 6th hydrologic unit code (HUC) watershed conditions include evaluating 12 indicators; (5) a standard watershed condition inventory is conducted according to R-3 Hydrology Note 14 for soil condition; (6) photograph points, ocular estimates to determine trends/acres are conducted as are step A for 6th HUC assessments, 10% annually for soil condition; (7) baseline watershed condition assessments (step A) were completed on all 101 6th HUC watersheds following the watershed condition framework process; (8) assessments were a qualitative and quantitative look at watershed condition and evaluated 12 resource indicators serving as an indication of watershed condition; (9) the information was input into a web-based application called Watershed Classification and Assessment Tracking Tool; and (10) the majority of 6th HUC watersheds (65%) are in functional at risk condition followed by properly functioning (21%), and impaired function (14%) (USFS 2010).

Limited water quality data are available for Upper and Lower Lakes Mary (AZDEQ 2012). In 2002, the U.S. Environmental Protection Agency reported mercury in fish tissue in Upper Lake Mary (861 acres in size). In 2004 and 2005 analyses, there were exceedances reported (AZDEQ 2012) for dissolved oxygen, mercury, nickel, and hydrogen sulfide. In 2002, the U.S. Environmental Protection Agency reported mercury in fish tissue in Lower Lake Mary (764 acres in size); in 2004 and 2005 analyses, there were exceedances reported (AZDEQ 2012) for pH and hydrogen sulfide.

Water quality was monitored in 2010 for exceedances in fecal coliform pathogens at several sites along Oak and Spring creeks by the Arizona Department of Environmental Quality and Friends of the Forest per forest plan and state and federal regulations (USFS 2010). Results indicated water quality exceeded standards on busy days at Slide Rock and consequently, both Spring Creek and Oak Creek remain listed as impaired for pathogens; reasons include unsanitary habits of swimmers and leaky septic systems on adjacent non-Coconino National Forest land. Lake water quality monitoring discontinued at Upper and Lower Lake Mary, Soldiers Lake, Soldiers Annex, and Lower Long Lake, but will resume in the next three-year cycle. Water quality results by stream are stored on this Internet link: <http://www.azdeq.gov/environ/water/assessment/assess.html>.

The occurrence of shallow groundwater in the Study Area is expressed via seeps from sedimentary rock fractures and bedding planes (NPS 2007). Numerous localized seeps have been recorded in the fractures and bedding planes of the steep canyon walls; prominent seeps occur in the tributary canyons on the south side of the Monument. It is believed that the seeps are recharged via local fractures and limestone “karst” erosion features in the watershed, and there is little threat of contamination or aquifer depletion under current land uses within the watershed. The only reliable groundwater beneath the Monument occurs at a depth greater than

1,500 feet within the regional Coconino Aquifer. The National Park Service maintains a well into the aquifer to supply operations at the Monument—the water table has declined about 10 feet over the last 30 years (NPS 2007).

During the Walnut Canyon National Monument General Management Plan (2007) preparation, the primary concern expressed about wetlands, floodplains, and riparian habitat was ensuring that the unique riparian resources are conserved within Walnut Canyon and its tributaries. The southern Colorado Plateau receives a limited amount of precipitation and surface water is limited. Streams, wetlands, and riparian habitats harbor a high percentage of regional biological diversity and are important resources (NPS 2007). Fish species include several that are formally protected under the Endangered Species Act (AGFD 2012). Numerous protected and sensitive plants, animals, and invertebrates are restricted to perennial streams, wetlands, or riparian habitats.

Many perennial streams and ephemeral tributary washes of the region and Study Area are affected by human uses, primarily livestock grazing but also by damming, diversion, and groundwater withdrawals for public water supply, hydropower generation, limited agriculture and industry, and public recreation. Narrow galleries of cottonwood, willow, and sycamore (*Platanus* spp.) trees once occupied most streambanks; these native species are now largely replaced by stands of nonnative tamarisk (*Tamarix* spp.) and disturbance-tolerant desert scrub. Available riparian habitat and natural stream and spring waters for wildlife have diminished during the last century, especially for bird species.

Reliable springs and seeps are rare throughout the region and even scarcer in the northern half. Although springs support small riparian areas, these are usually rich in plant species and provide important surface water for wildlife including elk (*Cervus elaphus*),

deer (*Odocoileus* spp.), and pronghorn (*Antilocapra americana*). Springs emerge from shallow, perched aquifers or from the large, regional Coconino Aquifer (Bills et al. 2000). Winter precipitation is important to recharge these aquifers. Most spring water within the inner basin of the San Francisco Mountains is completely used as part of the public water supply for the City of Flagstaff and many reliable springs that are near areas with good rangeland have been fully contained and diverted for livestock use and are less available to wildlife. Oak Creek and a few other sites are now popular public recreation attractions.

Wetland, floodplain, and riparian resources within the Study Area are restricted to the narrow canyon bottom and a number of perennial seeps found in the tributary canyons on the south side. The floor of Walnut Canyon supports approximately 80 acres of wetland and riparian woodland and shrubland vegetation, which is locally characterized by stands of Arizona walnut and narrowleaf cottonwood trees; box-elder, New Mexico locust, Arizona wild rose, and red osier dogwood shrubs; and sedges in the herbaceous layer. In the narrow reaches of the canyon, water catchment basins are scoured into Coconino sandstone bedrock, filled seasonally by local snowmelt and rainfall, and provide important water sources for wildlife.

Coconino National Forest, the National Park Service, and the City of Flagstaff are active members of the Lake Mary-Walnut Creek Watershed Technical Advisory Committee. The purpose of the committee is the development of study proposals designed to evaluate and implement, where appropriate, best management practices, reservoir modifications, and/or operational criteria to address the quality and quantity of the municipal water supply, increase the likelihood of flood flows, and improve the inner canyon environment in Walnut Canyon National Monument (USFS 2010). Water quality results by stream/lake are presented on this AZDEQ link: <http://www.azdeq.gov/environ/water/assessment/assess.html>.

Some of the impacts of diminished natural water sources for wildlife have been mitigated by the development of livestock tanks. Passive precipitation catchment systems or guzzlers have recently become popular for supporting wildlife, ranching, and recreational activities. However, they are not naturally distributed across the landscape and have likely changed species population numbers, seasonal ranges, vegetation browse levels, and species interaction patterns, including natural predator-prey relationships.

Riparian resources are buffered from most water quality degradation by surrounding undeveloped Coconino National Forest and Arizona State Trust Lands. However, the City of Flagstaff has annexed all lands to the north and west boundary of Walnut Canyon National Monument, including a relatively large area contiguous to the canyon rim and tributary canyons upstream of the Monument. Development of these lands within the relatively pristine canyon watershed could significantly increase nonpoint source pollution, such as motor and exhaust residue from streets, and fertilizers, herbicides, and pet waste from lawns, which would negatively affect wetland and riparian habitat and water quality.

WILDFIRE

The Coconino National Forest surrounds the entire city of Flagstaff. Forest types are largely characterized by ponderosa pine in addition to forest and woodland stands characterized by pinyon pine-Utah juniper and the resultant mixed conifer communities (USFS 2010). Urban areas that intermingle with forested lands are known as the urban interface. The Flagstaff urban interface consists of about 180,000 acres of Coconino National Forest, Arizona State Trust, military, National Park Service, City of Flagstaff, and privately managed/owned lands (GFFP 2012).

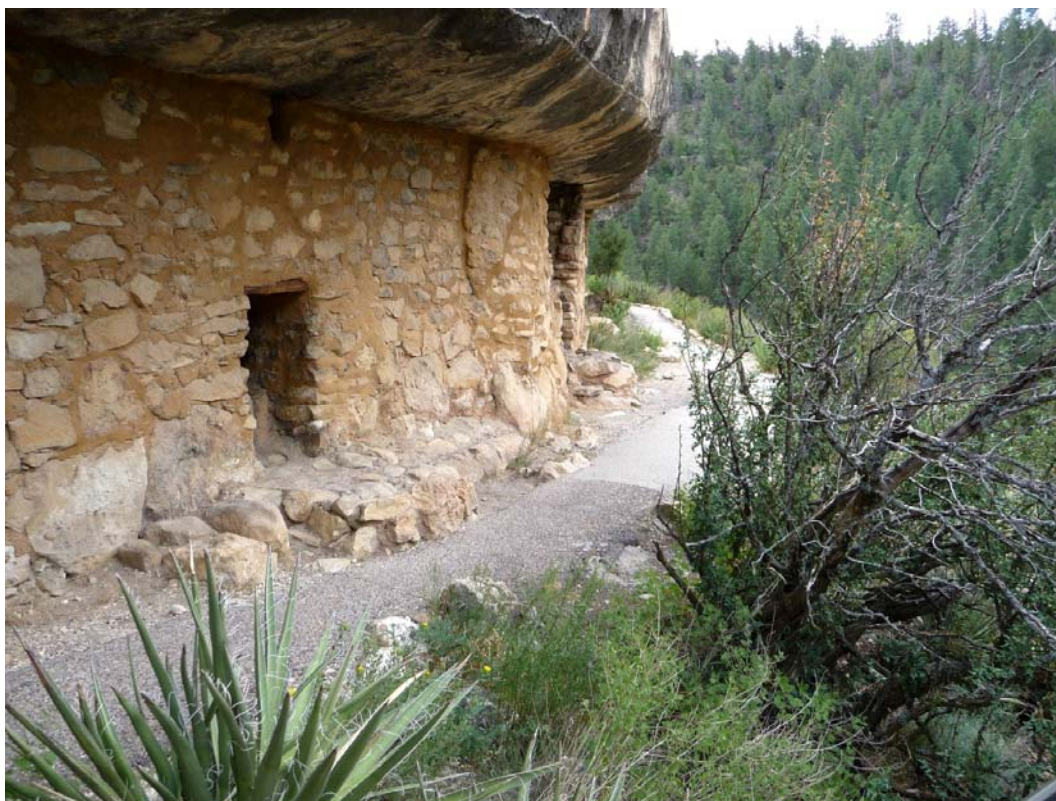
Changes in historic fire regimes, along with other events, have resulted in changes in successional dynamics, altered insect and

disease dynamics, decreased understory productivity, decreased tree health, growth and vigor, increased fuel accumulation and continuity, increased crown fire potential, and increased fire size and intensity (USFS 2010).

Presently, wildfires are infrequent but of high intensity; on average about 50% of a modern wildfire represents a stand-replacement event (usually in very large patches from 100s to 1,000s of acres in size). Annually, in the Coconino National Forest, an average of 1,500 forested acres are catastrophically burned. Since 1947, approximately 40,000 acres of forest and woodland have been consumed in stand-replacement wildfire (approximately 5% of the Coconino National Forest ponderosa pine forest type). The rate of acres lost to catastrophic wildfire in the vicinity of

the city of Flagstaff is increasing geometrically. The associated ecological loss in the vicinity of Flagstaff includes six each of Mexican spotted owl territories and northern goshawk territories lost or badly damaged between 1994 and 2001 (GFFP 2012).

Wildfire is the number one fire threat to Flagstaff and surrounding communities. The greater Flagstaff area averages around 150 ignitions per year, while within the City of Flagstaff alone, there are roughly 60 to 80 wildfires each year (CWPP for Flagstaff & Surrounding Communities 2004). In the past 10 years, the number of fires in Coconino National Forest have ranged from 122 (2012 and 2010) to a high of 410 (2003) forest-wide (USFS Stakeholder Report 2012).



Cliff Dwelling

Walnut Canyon Study Area - Planned and Accomplished Activities

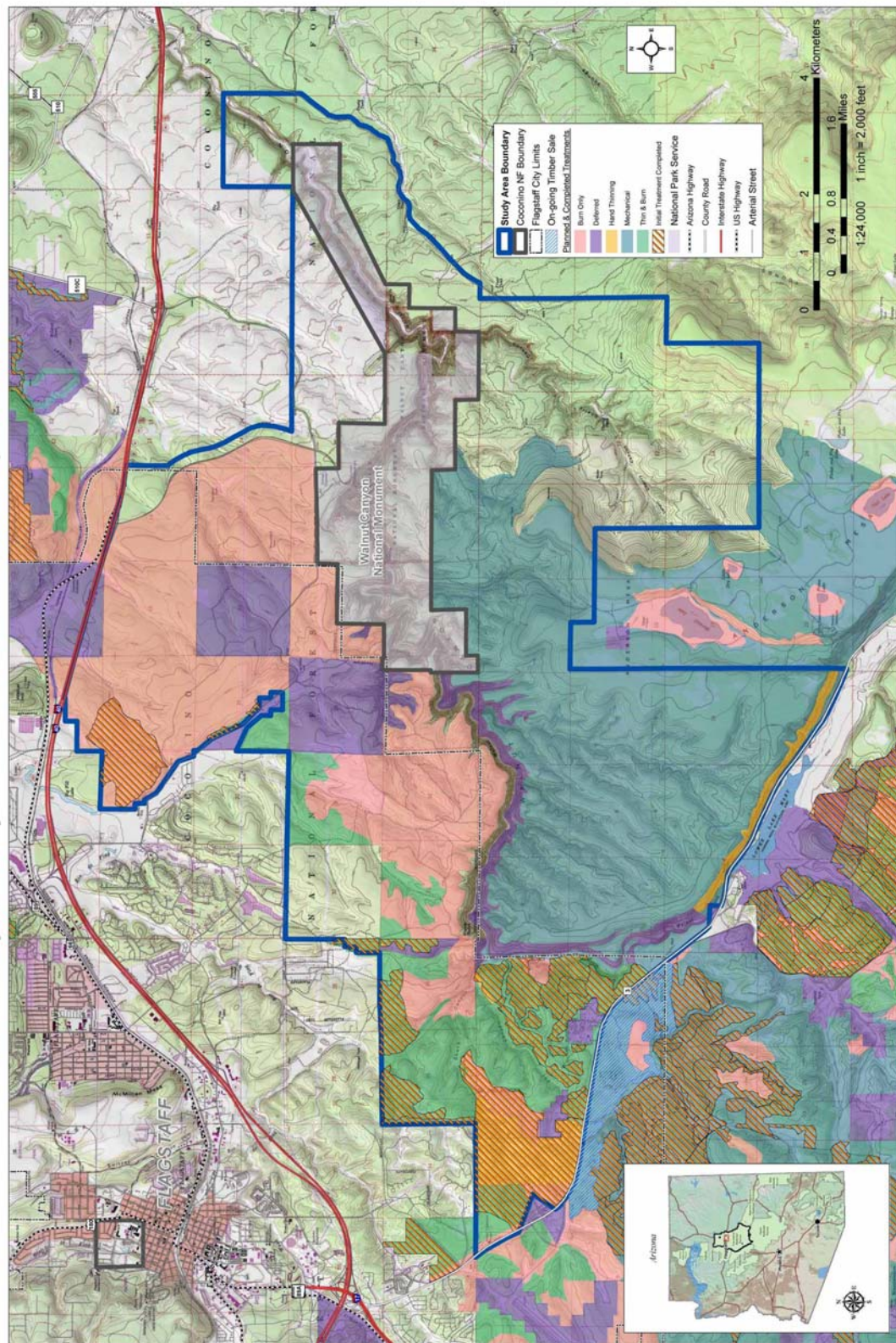


FIGURE 8. FIRE FUELS ACTIVITIES

A number of efforts are underway to reduce the risk of catastrophic wildfire within the Flagstaff urban interface, they include: (1) Grand Canyon Forests Partnership – analyze and treat forests for the reduction of catastrophic wildfire and restoration of forest health using thinning and prescribed fire; (2) Coconino National Forest – conducts numerous thinning and prescribed burning projects annually (see figure 6); (3) Arizona State Land Department – manages forest fuels conditions by thinning; (4) Flagstaff Fire Department – reduces catastrophic fire conditions using prescribed fire, a seasonal thinning crew, fuel management officer, and upgraded wildland fire equipment; and (5) Ponderosa Fire Advisory Council – conducts a fuel management program within developed areas of member fire departments (GFFP 2012).

The City of Flagstaff and Coconino County have encouraged homeowners to assume more responsibility for preventing damage and loss from wildfires, including fire safety education, homeowner responsibilities for fire prevention, and actions for reducing damage and loss from potential wildfires in and around private homes and property. Building codes and zoning regulations address private property requirements, with a land development code that dictates the amount of tree removal allowed in city areas; new subdivisions require forest stewardship plans that have a review process by the Flagstaff Fire Department for compatibility with wildland fire protection.

The U.S. Forest Service, in the Flagstaff / Lake Mary Ecosystem Analysis (FLEA) amendments, developed desired future conditions for the Study Area to reduced threat of and potential for destructive crown wildfire, especially in the Urban / Rural Influence and Wildland / Urban Interface zones (USDA Forest Service 1987, amended).

This involves reducing ladder fuels, crown canopy and competition between closely spaced trees in some areas to promote future large trees faster and to achieve desired tree sizes and canopy closures outlined in the Forest Plan, and to increase in the forest's resistance to insects and disease. Desired future conditions also involve maintaining the presence of fire in a "natural ecological role within the constraints of human health and safety" (USDA Forest Service 1987 amended).

The U.S. Forest Service recently prepared an environmental assessment for the proposed Marshall Fuels Reduction and Forest Restoration project. The Marshall Fuels Reduction and Forest Restoration project area is approximately 12,000 acres southeast of Flagstaff, roughly between Lake Mary Road and Walnut Canyon National Monument, and includes part of Anderson Mesa. The primary purpose of this project is to reduce the risk of uncharacteristic wildfire and to improve the health of the forest and associated habitats in the Marshall Project Area, according to Coconino National Forest Plan guidance. As the project falls within the Flagstaff / Lake Mary Ecosystem Analysis (FLEA) area and within the Study Area. The Forest Plan guidance dictates that "use of wildland fire is not acceptable or desirable. Therefore, future management actions for wildfire in the project area will continue to be full suppression (USFS 2010).

Coconino National Forest staff is also actively engaged in a collaborative, landscape-scale initiative designed to restore fire-adapted ecosystems in the Southwestern Region. The overall goal of the Four Forest Restoration Initiative (4FRI) is to restore the structure, pattern and composition of fire-adapted ecosystems, which will provide for fuels reduction, forest health, and wildlife and plant diversity (USDA 2011).

THIS PAGE INTENTIONALLY LEFT BLANK

MANAGEMENT OPTIONS ASSESSMENT

Under all management options, it is assumed that the Forest Service would continue to comply with regulations, policies, and directives and manage forest resources under the forest plan, forest plan revisions, and other resource management plans for lands under Forest Service responsibility. The plans support multiple use and plan objectives, strategies, and actions strive to balance resource protections with use. It is acknowledged, however, that the programs could be affected by changes to levels of funding, policies and the need for additional resource protection to offset user impacts. It is also acknowledged that currently access to the forest is free. Per the Recreation Enhancement Act, fees may be charged for developed sites (including trailheads), however, there is currently no authority to charge fees for general access to forest managed lands.

This study does not assume a specific time line for actions required by the secretaries of agriculture and interior, which could be submitting the special study to Congress, with or without a recommendation. There is also no assumption of when Congress could act on a recommendation.

EFFECTS TO NATURAL AND CULTURAL RESOURCES

In all management options, the U.S. Forest Service would retain management of the Study Area (excluding Arizona State Trust Lands and private inholdings). The U.S. Forest Service is mandated by federal laws, regulations, executive orders, and USFS policies and directives, and regional and forest orders to manage and protect cultural and natural resources. The U.S. Forest Service would continue to define management objectives and strategies in the forest plan, forest plan revisions, and other resource management plans, which are subjected to the National Environmental Policy Act and public

involvement. The U.S. Forest Service is also constrained by budgets. It is not anticipated that current management of cultural or natural resources would be significantly altered due to implementation of one of the management options.

In addition to complying with regulations and policies, Coconino National Forest has programs for invasive species, water resources, and wildfire described below. It is not anticipated that these programs would change based on implementation of one of the management options; although it is acknowledged that the programs could be affected by changes to levels of funding.

OPTION 1: CONTINUED MANAGEMENT BY U.S. FOREST SERVICE

Under this option, the U.S. Forest Service would continue to manage the Study Area. Forest Service management is dynamic to balance resource protection with the multiple-use mission. There are portions of three grazing allotments within the Study Area. Recreational activities include camping, mountain biking, horseback riding, rock climbing, hunting, and hiking, which would be allowed to continue. Recreational facilities include Canyon Vista Campground (concessioner operated), the Arizona Trail, several trails connecting to the Flagstaff Urban Trail System, Fisher Point, and approximately 32 miles of USFS-managed hiking, biking, and equestrian trails, including the Campbell Mesa trail system, and an approximately 8-mile segment of the future Flagstaff Loop Trail, all of which would be maintained.

The Coconino National Forest Management Plan states that for this management area (MA 37, no land exchanges will occur unless the purpose is *to acquire land within* MA 37

through exchange of lands of national forest elsewhere. This means that the Forest Service may possibly trade lands elsewhere to acquire inholdings within MA 37, but that no USFS lands within MA 37 would be exchanged in order to acquire lands or resource interests outside MA 37. This is the strongest management policy that can be made at the local Forest Service level. Although a future change in policy is possible, once such a policy is adopted, future changes are unlikely and could only be implemented through a management action subject to public involvement. Final decisions regarding changes to the Forest Plan, after public involvement, are under the authority of the forest supervisor, while actual land exchanges can only be authorized at a higher level, by the regional forester.

Nonmotorized access is virtually anywhere along the boundary and at this time access to the forest is free. Motorized access is on designated roads and management currently under the travel management plan (2011).

In the future, the Forest Service may be able to trade for Arizona State Trust Lands. Although, the Forest Service can accept donated land, the Arizona State Land Trust cannot donate lands.

Maintaining current management supports the local interest in maintaining existing multiple use while allowing the locally based Coconino National Forest decision authority of future management, while working cooperatively with the National Park Service, Flagstaff, Coconino County, Arizona State Land Department, and Arizona Game and Fish Department in addressing regional land use and land use issues.

OPTION 2: SPECIAL MANAGEMENT DESIGNATION

Congress designates special management areas within the national forest system. Nearly one hundred special management areas have been established on federal lands. Most areas

have been created out of National Forest land, but this is not always the case. The special management area designation continues to be used regularly by Congress.

The legislation establishing each special management area is unique, but the designations generally fall into the following categories: national monuments (Mount St. Helens National Volcanic Monument, Washington), game refuges (Newberry Wildlife Refuge, Oregon), scenic areas (Natural Arch National Scenic Area, Kentucky), other protected areas, and recreation areas (Sabino Canyon National Recreation Area, Arizona).

Legislation establishing the special management areas asserts the importance of the area. While most acts creating special management areas express similar purposes for designation, there are subtle differences between designation types. For example, the preservation of scenic and natural resources is prioritized in the designation of scenic and other protected areas. Recreation is protected, but not prioritized. Acts setting aside recreation areas, on the other hand, usually include specific provisions to protect appropriate recreational uses within the area while also asserting resource protections. In each case, when Congress withdraws the lands comprising the special management area it does not usually provide explicit language (but can) barring the Forest Service from exchanging lands. Most of the focus is in the provision of mechanisms to consolidate lands within the area under USFS management. Even if the legislation was silent on this issue, an area's specific land management plan may outline the circumstances for retention or exchange of land within or adjacent to the area's boundary.

In most cases, management provisions for scenic and recreational areas include restrictions on mineral leasing and timber harvest (except to protect resource conditions). Historical/traditional public access, use, and recreational opportunities are typically retained, though some areas limit off-road vehicle use or other activities that

conflict with the purpose for which the area was set aside. Legislation often establishes an advisory council or some other type of cooperative committee to direct or assist in management planning. Pursuing a special designation would result in an increased emphasis on the specific purpose noted, potentially resulting in long-term changes that restrict other desired uses.

The Coconino National Forest currently has regional forester special area designations, including research natural areas and botanical and geological areas. Research natural areas (RNAs) and botanical and geological areas are designated to ensure protection of specific biological and geological communities. Research natural areas are experimental controls for a particular vegetation type, and botanical and geological areas are designated for a special feature such as a rare plant or exemplary geological formation. There are four existing research natural areas in Coconino National Forest: Casner Canyon, G. A. Pearson, Oak Creek, and San Francisco Peaks. The G. A. Pearson is within the Fort Valley Experimental Forest and therefore is not managed by the U.S. Forest Service. Oak Creek and the San Francisco Peaks research natural areas are within designated wilderness. The draft revised forest plan is proposing three new research natural areas: West Clear Creek, Rocky Gulch, and an expansion of the San Francisco Peaks research natural area. West Clear Creek and the expansion of Francisco Peaks are within existing wilderness areas. There are four botanical areas: Verde Valley, Mogollon Rim, Fossil Springs, and Fern Mountain, and one geological area: Red Mountain (USFS 2011).

To conserve and protect the natural and scenic qualities of the Study Area are high priorities; therefore, the most likely special management designations for the lands considered in the Study Area are “National Conservation Area” and “National Scenic Area.” A national recreation area designation

could result in additional recreation types and development. A special designation could potentially limit future community/public infrastructure development in the area.

A special management designation could subject future actions involving land acquisition / disposal / exchange to congressional approval if Congress writes this language into the enabling legislation. The public could provide input into what the enabling legislative contains, but it is ultimately written by Congress. The special designation would not apply to Arizona State Trust Lands nor change the status of Arizona State Trust Lands, unless acquisitions or exchanges were approved.

OPTION 3: CONGRESSIONAL RESTRICTION ON LAND DISPOSAL OR EXCHANGES

To address the primary concern to protect the land from development in perpetuity, Congress could approve legislation for specific land management direction, i.e., restriction on disposing of land out of federal ownership. No concrete examples for this scenario were discovered during the research phase of this study.

This type of congressional restrictions would raise land disposal actions to requiring an act of Congress. This would not change the status of State Trust Lands nor change the status of Arizona State Trust Lands unless acquisitions were approved.

SUMMARY/COMPARISON TABLE AND SUGGESTIONS

The following table provides a brief summary of how each option meets goals, objectives, and public concern.

TABLE 2. SUMMARY/COMPARISON TABLE

	Option 1: Continue Management by USFS	Option 2: Special Management Designation	Option 3: Congressional Restriction on Disposal
Support current range of multiple use	Yes	Continued management by the USFS. Use emphasis could change, resulting in either increases or decreases in some use	Same as Option 1 - Continued management by the USFS
Local decision making to respond to changes in future needs	Yes	More constrained than Option 1	Same as Option 1
Protection of cultural resources	No change. Protected by current federal law and regulation	Could provide expanded opportunities for interagency partnerships in education and resource protection	Same as Option 1
Natural resources	No change, continue to manage resources per regulatory requirements	Same as Option 1	Same as Option 1
Water resources	No change, continue to manage resources per regulatory requirements	Same as Option 1	Same as Option 1
Fire management	No change, continue to manage resources per regulatory requirements	Same as Option 1	Same as Option 1
Threatened, endangered, and species of special concern	No change. Protected by current federal law and regulation	Same as Option 1	Same as Option 1
Recreation and visitor use	Use responds to growth, changes in activities. Supports FUTS and Loop Trail	Could increase or decrease depending on designation	Same as Option 1
Public access and fees	No change in fees, Coconino Travel Management Plan	Same as Option 1 unless increased emphasis on developed recreation, or restriction to protect resources	Same as Option 1
Land use in the special study area	No change Allowable land use consistent with Forest Service policies and local site and planning considerations	Allowable land uses may be defined by congressional action	Same as Option 1
USFS management	No change, management objectives are defined under Forest Plan	Adds additional layer of planning and staffing responsibility; may change depending on the designation	Same as Option 1

TABLE 2. SUMMARY/COMPARISON TABLE

	Option 1: Continue Management by USFS	Option 2: Special Management Designation	Option 3: Congressional Restriction on Disposal
Arizona State Trust Lands / private inholdings	No change Forest plan would be amended to include any acquired lands	Same as Option 1	Same as Option 1
Achieves primary goal of protecting the land from development in perpetuity	Land exchange approved at forest or USFS region level	Land disposal would require act of Congress	Land disposal would require act of Congress



Cliff Dwelling on Island Trail

THIS PAGE INTENTIONALLY LEFT BLANK

PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION

The U.S. Forest Service and the National Park Service jointly initiated the special study in February 2010 to explore management options for the Study Area, per direction from the Omnibus Public Land Management Act of 2009. One of the directives of the act and objectives of this project was to “meaningfully engage stakeholders, City of Flagstaff, and Coconino County governments, American Indian tribes, other agencies, and the general public at local and national levels to determine their desires for future management of this area.”

The planning team developed a public involvement plan that included compiling an initial project mailing list from databases supplied by the National Park Service, U.S. Forest Service, the City of Flagstaff, and Coconino County officials, newsletters, a project-specific website, press releases, and open house events.

The initial public outreach period was conducted from March 22 through July 26, 2010. A newsletter was sent to the initial project mailing list. Information was also posted to the project-specific website. Press releases were prepared to announce the project and public meetings and were sent to local newspapers, radio stations, and organizations totaling over 100. The U.S. Forest Service, National Park Service, Coconino County, and Flagstaff representatives hosted a series of open house events in April 2010.

The open house events provided an opportunity for the public to engage in dialogue with the partner agencies; to learn about the special study (history, purpose, outcomes, etc.); ask questions; and discuss concerns. Opportunities were available for one-on-one discussions as well as to look and listen. The public was encouraged to provide input and comment in their own words, either at the open house events or at their

convenience on the project website or on the comment forms. A total of 328 pieces of correspondence was received during the first public outreach period. All correspondence was analyzed for comments and summarized in a report. This document is available on the project website and is incorporated by reference (Walnut Canyon National Monument Special Study Comments, through August 2010). The comments were reviewed and discussed for the development of the management options.

The second phase of public outreach was initiated on May 10, 2011, through July 31, 2011. A second newsletter was prepared and sent to the updated project mailing list. This newsletter provided current project and open house schedules, brief descriptions of preliminary management options, options for state trust lands, and a summary of the management options workshop held with representatives of Coconino National Forest, Walnut Canyon National Monument, National Park Service Intermountain Region, City of Flagstaff, and Coconino County. The website was updated with new project information and a press release was sent to local newspapers, radio stations, and organizations totaling over 100 media outlets.

The U.S. Forest Service, National Park Service, Coconino County, and Flagstaff representatives hosted a second series of open house events in May 2011. The open house events provided an opportunity for the public to hear a presentation on the process and preliminary management options, engage in dialogue with the partner agencies, ask questions, and discuss concerns.

Opportunities were available for group and one-on-one discussions. The public was encouraged to provide input and comment in their own words, either at the open house events or at their convenience on the project website or on the comment forms. A total of

113 comments were received during this phase of public involvement. Comments were summarized in a report. This document is available on the project website and is incorporated by reference (Walnut Canyon Special Study Comments, May 2011 through July 2011).

TRIBAL CONSULTATION

On July 28, 2011, the National Park Service and U.S. Forest Service sent a joint letter to the 16 tribes who claim cultural affiliation to the Walnut Canyon area. A letter was received from the Hopi Tribe providing comments and accepting an invitation to meet and discuss the special study. The letters are included in the summary reports referenced above.

AGENCY INVOLVEMENT

As part of the public involvement process, newsletters were also sent to local, state, and federal agencies, including:

Advisory Council on Historic Preservation
Arizona Department of Commerce
Arizona Department of Environmental Quality
Arizona Department of Game and Fish
Arizona Department of Mines and Mineral Resources
Arizona Department of Transportation
Arizona Department of Water Resources
Arizona Governor's Office
Arizona Historical Society
Arizona Housing Allowance
Arizona Public Service
Arizona State Historic Preservation Office
Arizona State Land Department
City of Flagstaff

City of Sedona
Coconino County
Coconino County Parks & Recreation
Coconino County Public Works
Federal Highway Administration
Flagstaff Public Library
Grand Canyon National Park
National Park Service
National Resources Conservation Service
Northern Arizona Intergovernmental Public Transportation Authority
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Geological Survey
U.S. Naval Observatory
U.S. Senator John Kyl
U.S. Senator John McCain

Representatives from the U.S. Forest Service, National Park Service, City of Flagstaff, and Coconino County make up the planning team. Representatives from Arizona State Trust Lands also participated in the management options workshop. Arizona Game and Fish Department provided letters during both public involvement phases—these letters are included in the summary reports referenced above.

PUBLIC INVOLVEMENT AND AGENCY AND TRIBAL CONSULTATION FOR THE DRAFT STUDY REPORT

The public, tribes, and agencies will have an opportunity to review and comment on the draft special study report.

public involvement
tribal consultation
agency involvement
consultation letters

SELECTED REFERENCES

- Anonymous
1992 A checklist of the birds of Walnut Canyon National Monument. Southwest Parks and Monuments Association, Tucson, AZ.
- Arizona Department of Environmental Quality (AZDEQ)
2012 Little Colorado River Watershed Data. Accessed online at: http://www.ADEQ_Water_Quality_Data.pdf.
- 2012 Water Quality Information. Accessed online at: <http://www.azdeq.gov/environment/water/assessment/assess.html>.
- Arizona Department of Mines and Mineral Resources (ADMMR)
2012 Mineral Rights and Mining Claims. Accessed online at: <http://mines.az.gov/info/mineralrights.html>.
- Arizona Game and Fish Department (AGFD)
2012a Game Management Unit 5B. Accessed online at: http://www.azgfd.gov/h_f/hunting_units_5b.shtml.
- 2012b Heritage Data Management System. Special Status Species by County, Taxon, and Scientific Name. Accessed online at: http://www.azgfd.gov/w_c/edits/documents/ssspecies_bycounty_007.pdf.
- 2012c Landowner Relations Program. Accessed online at: www.azgfd.gov.
- 2012d Watchable Wildlife Program. Accessed online at: http://www.azgfd.gov/outdoor_recreation/watchablewildlife/ArizonaWatchableWildlifeProgram.shtml.
- Bailey, R.G.
1995 Updated 2002. Ecoregions of the United States. Accessed online at: <http://www.fs.fed.us/im/ecoregions/products/map-ecoregions-united-states/>.
- Bausch, D. B. and D.S. Brumbaugh
1997 Flagstaff Community Earthquake Hazard Evaluation, Coconino County, Arizona. Accessed online at: <http://www.cefns.nau.edu/Orgs/aeic/reports/flag.html>. Arizona Earthquake Information Center. Northern Arizona University. Flagstaff, AZ.
- Bowker M. A. and Belnap J.
2008 Spatial modeling of biological soil crusts to support land management decisions. Department of Environmental Science, Northern Arizona University and U.S. Geological Survey. Published Report-653532.
- Brian, N.
1992 Historical review of water flow and riparian vegetation at Walnut Canyon National Monument, Arizona. Technical report (Cooperative National Park Resources Studies Unit [Tucson, AZ]); no. 44.

SELECTED REFERENCES

- Bright, J. L., and C. van Riper III
2000 Pronghorn home ranges, habitat selection and distribution around water sources in northern Arizona. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Colorado Plateau Field Station Tech. Report. USGSFRESC/COPL/2000/.
- Chronic, H.
1988 "Pages of Stone." *The Mountaineers*. Seattle, WA.
- City of Flagstaff, Arizona
1998 Open Spaces and Greenways Plan; Greater Flagstaff Living with Open Spaces. Accessed online at: <http://www.flagstaff.az.gov/DocumentCenter/Home/view/7959>.
- Coconino County
2012 Comprehensive Plan: Natural Environment. Accessed online at: <http://www.coconino.az.gov/communitydevelopment/ComprehensivePlan/NaturalEnvironment.ASP>.
- Coconino County and City of Flagstaff
2001 Joint Flagstaff Area Regional Land Use and Transportation Plan. Completed and adopted by the Flagstaff City Council and the Coconino County Board of Supervisors in 2001 and approved by Flagstaff voters in May 2002. Flagstaff, AZ.
- Covington, W. W. and M. M. Moore
1994 Southwestern ponderosa forest structure: changes since Euro-American settlement. *J. For.* 92 (1), 39–47.
- Drost C.
2009 Inventory of Mammals at Walnut Canyon, Wupatki, and Sunset Crater National Monuments. Natural Resource Technical Report. NPS/SCPN/NRTR–2009/278. National Park Service Natural Resource Program Center. Fort Collins, CO. Published Report-663821.
- Flagstaff Regional Plan
2011 Draft Community Profile (Community_Profile_063011.pdf). Flagstaff, AZ.
- Graham, J.
2008 Walnut Canyon National Monument Geologic Resource Evaluation Report. Natural Resource Report NPS/NRPC/GRD/NRR—2008/040. National Park Service, Denver, CO.
- Greater Flagstaff Forests Partnership (GFFP)
2004 Community Wildfire Protection Plan for Flagstaff and Surrounding Communities in the Coconino and Kaibab National Forests of Coconino County, AZ. <http://library.eri.nau.edu/cgi-bin/library>.
- 2012 Sustaining Our Forest and Flagstaff Area Wildfire Risk Assessment. Accessed online at: www.gffp.org.
- Hansen, M., J. Coles, K. Thomas, D. Cogan, M. Reid, J. Von Loh, and K. Schulz
2004 USGS-NPS Vegetation Mapping Program: Walnut Canyon National Monument, Arizona, Vegetation classification and Distribution. USGS Southwest Biological Science Center. Flagstaff, AZ.

- Hiebert R and Hudson H.
2010 Inventory of exotic plant species occurring in the Resource Preservation Zone of Walnut Canyon National Monument, Arizona. Natural Resource Technical Report. NPS/SCPN/NRTR—2010/314. National Park Service, Natural Resource Program Center. Fort Collins, CO. Published Report-2166460.
- Hoffmeister, D. F.
1986 Mammals of Arizona. University of Arizona Press and Arizona Game and Fish Department. Phoenix, AZ.
- Huisinga, K., P. Hogan, K. Wright, H. Hamilton, and S. Crow
2000 Special Status Plants of the Flagstaff Area National Monuments. Final Report to the National Park Service, Arizona Ethnobotanical Research Association.
- Middleton, L. T., D. K. Elliott, and M. Morales
2003 Coconino Sandstone in Grand Canyon Geology, edited by S.S. Beus and M. Morales. New York: Oxford University Press, 2nd edition.
- National Oceanic and Atmospheric Administration (NOAA)
2010 Precipitation data from www.ncdc.noaa.gov/ol/climate/online/coop-precip.html for the Walnut Canyon reporting station. Temperature data from www.ncdc.noaa.gov/ol/climate/climatedata.html for the Flagstaff area. Accessed 1997–2003.
- National Park Service (NPS)
2007 Walnut Canyon National Monument. Final Environmental Impact Statement and General Management Plan, January 2007.
- 2011 Inventory and Monitoring Program, NPSpecies Database. 2011. Certified Species Lists for all Taxonomic Categories in Walnut Canyon National Monument. Integrated Resources Management Applications. Accessed online at: <https://irma.nps.gov/App/Portal/Home>.
- NatureServe Explorer
2012 An Online Encyclopedia of Life. Accessed online at: <http://natureserve.org/explorer/>.
- Neff, T., T. Gibbs, K. Spurr, K. C. Anderson, J. Nez, and B. Carey, with essay by D. R. Wilcox
2011 An Assessment of the National Significance of Cultural Resources for the Walnut Canyon Special Resource Study. Cooperative Agreement No.: H1200090005, Task Agreement and Requisition No.: J7470100419, Project No.: MNA-42. Museum of Northern Arizona. Flagstaff, AZ.
- Nowak, E. M., T. B. Persons, and A. J. Monatesti
2003 2002 Progress report on herpetofauna inventories of southern Colorado Plateau national parks. Report to Southern Colorado Plateau Inventory and Monitoring Network. USGS Colorado Plateau Field Station, Flagstaff, AZ.

SELECTED REFERENCES

- NPSpecies Database
2011 Accessed online at:
<http://science.nature.nps.gov/im/apps/npspp/>.
ology/inventory/publications/
map_graphics/
waca_map_graphic.pdf)
- Omernik, J. M.
1987 Ecoregions of the
conterminous United States.
Map (scale 1:7,500,000).
Annals of the Association of
American Geographers
77(1):118-125.
- Phillips, K. A.
2009 Arizona Land Ownership
Status. Circular No. 2. Arizona
Department of Mines and
Mineral Resources. Phoenix,
AZ.
- Persons T. B. and E. M. Nowak
2008 Inventory of Amphibians and
Reptiles for Twelve National
Parks in the Southern
Colorado Plateau Network.
National Park Service, United
States Geological Survey,
Northern Arizona University.
Unpublished Report-660457.
- Raucci, Jason, Michael Ort, Ronald C. Blakey,
Paul J. Umhoefer, Nathan O. Blythe, and
Mark Manone
2004 National Park Service geologic
resource evaluation; geologic
mapping of Walnut Canyon
National Monument and
Petrified Forest National Park,
northern Arizona. Boulder:
Geological Society of America,
Abstracts with Programs, Vol.
36, 230.
- Raucci, J., N. Blythe, M. Ort, and M. Manone
2003 Geologic Map of the Greater
Walnut Canyon National
Monument Area. Scale
1:12,000. Northern Arizona
University. Unpublished
digital map.
(<http://www.nature.nps.gov/ge>
- Pearthree, P. A., K. R. Vincent, R. Brazier, and
D. M. Kendricks
1996 Plio-Quaternary faulting and
seismic hazard in the Flagstaff
area, northern Arizona:
Arizona Geological Survey
Bulletin 200.
- Santucci, Vincent L. and V. Luke Santucci Jr.
1999 An inventory of
paleontological resources
from Walnut Canyon National
Monument, Arizona. In
National Park Service
Paleontological Research. Vol.
4. Edited by Vincent L.
Santucci and Lindsay
McClelland. GRD Technical
Report
NPS/NRGRD/GRDTR-
99/03, p. 118- 120.
- Schon, K.
2000 Saguaro National Park and
Walnut Canyon National
Monument 2000 Fire Effects
Report. Fire Effects
Monitoring Program, Saguaro
National Park, AZ.
- Short, M. S.
1988 Walnut Canyon and Wupatki:
A History. M.S. Thesis.
Northern Arizona University.
- Solomonson, M. G.
1973 The Mammals of Walnut
Canyon National Monument.
Plateau 43(1).
- Southwest Vegetation Management
Association
2012 San Francisco Peaks Weed
Management Area. Accessed
online at:
<http://www.swvma.org/sanfranciscopeakswma.htm>.

- Toupal, Rebecca S., Richard W. Stoffle
2004 Traditional Resource Use of the Flagstaff Area Monuments, Final Report. Bureau of Applied Research in Anthropology, University of Arizona, Tucson, AZ, July 19, 2004.
- U.S. Department of Agriculture (USDA)
2012 Natural Resource Information System: Threatened, Endangered, and Sensitive Species and Invasive Species Information.

2012 Official Soil Series Descriptions. Accessed online at: http://soilseries.sc.egov.usda.gov/OSD_Docs/html.
- U.S. Department of Agriculture, Forest Service, Climate Change Resource Center
2012 Western U.S. Bark Beetles and Climate Change. Accessed online at: <http://www.fs.fed.us/ccrc/topics/insects-disturbanec/barkbeetles.shtml>.
- U.S. Department of Agriculture (USDA), Forest Service, Coconino and Kaibab National Forest
2011 Proposed Action for Four-Forest Restoration Initiative http://www.fs.fed.us/nepa/nepa_project_exp.php?project=34857
- U.S. Department of Agriculture (USDA), Forest Service, Southwest Region
2005 Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds. Coconino, Kaibab, and Prescott National Forests within Coconino, Gila, Mojave, and Yavapai Counties, AZ. Coconino National Forest. Flagstaff, AZ.
- U.S. Department of Agriculture, Natural Resources Conservation Service
2011 Wildfire Recovery Tips for Soil Erosion. Accessed online at: <http://www.az.nrcs.usda.gov/news/releases/Arizona-Wildfire-Recovery-Tips.html>.
- U.S. Department of Agriculture, Forest Service, Coconino National Forest, Flagstaff Ranger District
2012 Grazing Annual Operating Instructions. Signed in 2012 by Deputy District Ranger, J. J. Hensiek. Flagstaff, AZ.
- U.S. Department of Agriculture, Forest Service, Coconino National Forest
1987 Revision Management Plan, Forest Plan Revision. Accessed online at: (<http://www.fs.usda.gov/detail/coconino/landmanagement/planning/?cid=stelprdb5334655>)

2010 Monitoring and Evaluation Report, FY 2010. Signed in 2011 by Forest Supervisor, M. Earl Stewart. Flagstaff, AZ.
- U.S. Department of Agriculture, Natural Resources Conservation Service and University of Arizona, Water Resources Research Center
2011 Canyon Diablo Watershed, Rapid Watershed Assessment Report. In cooperation with : Coconino Natural Resource Conservation District; Arizona Department of Agriculture; Arizona Department of Environmental Quality; Arizona Department of Water Resources; Arizona Game & Fish Department; Arizona State Land Department; USDA Forest Service; and USDI Bureau of Land Management. Tucson, AZ.

SELECTED REFERENCES

U.S. Department of the Interior, Fish and Wildlife Service and Arizona Game and Fish Department

- 2011 Biological Assessment of the AGFD Statewide and Urban Fisheries Stocking Program; Little Colorado River Watershed.

U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS)

- 1995 Recovery plan for the Mexican Spotted Owl: vol. I. USDI Fish and Wildlife Service, Albuquerque, New Mexico, USA.

- 2011 Draft Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*), First Revision. U.S. Fish and Wildlife Service. Albuquerque, New Mexico, USA.

- 2012 Coconino County Threatened and Endangered Species Tabular Information. Accessed online at: <http://www.fws.gov/southwest/es/arizona/Documents/CountyLists/Coconino.pdf>

U.S. Environmental Protection Agency (EPA)

- 2012 Ecoregion and Watershed Information. Accessed online at: <http://www.epa.gov>.

U.S. Forest Service (USFS), Coconino National Forest

- 2003 Flagstaff/Lake Mary Ecosystem Analysis (FLEA) Area. Forest Plan Amendment Number 17. Accessed online at: <http://www.fs.usda.gov/detail/full/coconino/landmanagement/projects/?cid=stelprdb53461838&width=full#02Dec20>.

- 2008 Revision Management Plan, Forest Plan Revision. Accessed

online at: (<http://www.fs.usda.gov/detail/coconino/landmanagement/planning/?cid=stelprdb5334655>).

- 2010 Environmental Assessment Marshall Fuel Reduction and Forest Restoration Project. Accessed on line: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=31437

- 2011 Draft Land Management Plan. Management Areas. Flagstaff, Arizona.

- 2011 Record of Decision, Travel Management Project and Final Environmental Impact Statement. Accessed online at: <http://www.fs.usda.gov/detail/coconino/landmanagement/projects/?cid=stelprdb5263010>.

- 2012 Stakeholder Report. Accessed online: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5408235.pdf

- 2012 Invasive Weeds. Accessed online at: http://prdp2fs.ess.usda.gov/detail/coconino/landmanagement/resourcemanagement/?cid=fsbdev3_054805.

U.S. Geological Survey (USGS)

- 2009 Geographic Information System Coverages for the Special Study Area. Accessed online at: <http://biology.usgs.gov/npsveg/waca/images/wacavegmap.pdf>.

U.S. Geological Survey (USGS) and National Park Service (NPS)

- 2012 Vegetation Map for the Entire Walnut Canyon Study Area,

Produced in 2009. Accessed online at:
<http://biology.usgs.gov/npsveg/waca/images/wacavegmap.pdf>.

U.S. Government Printing Office (GPO)
2009 Omnibus Public Land Management Act of 2009. Public Law 111-11; 123 STAT.991. 11th Congress. Washington, D.C. Wilderness Act (16 USC 1131 et seq.). 1964. (P.L. 88-577, 78 Stat. 890 as amended; 16 USC 1131(note), 1131-1136). Accessed online at:
http://www.fsa.usda.gov/Internet/FSA_File/wilderness_act.pdf.

Western Regional Climate Center (WRCC)
2012 <http://www.wrcc.dri.edu/>.
Desert Research Institute.
Reno, NV.

LAWS AND REGULATIONS

Land and Water Conservation Fund Act amendments. June 10, 1977 (Public Law 95-

42) (91 Stat. 210). Increased the authorizations for acquisition of certain previously authorized areas. LWCF (16 USC 460l - 460l-11); The Recreation Coordination and Development Act (Public Law 88-29, approved May 28, 1963, 77 Stat. 49). Accessed online at:
<http://www.fws.gov/laws/lawsdigest/LWCONS.html>.

National Environmental Policy Act of 1969, as amended. (Pub. L. 91-190, 42 USC 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982). Accessed online at: <http://ceq.hss.doe.gov/nepa/regs/nepa/nepaeqia.htm>.

National Parks and Recreation Act of 1978. Public Law 95-625; 92 STAT 3467 (16 USC 1a-5et seq.). 95th Congress. Accessed online at: <http://www.nps.gov/mawa/upload/Public-Law-95-625.pdf>.

Public Law 111-11 – Omnibus Public Land Management Act of 2009

The White House, Executive Order 13112. 1999. Invasive Species. Accessed online at: <http://ceq.hss.doe.gov/nepa/regs/eos13112.html>.

THIS PAGE INTENTIONALLY LEFT BLANK

PLANNING TEAM

U.S. Forest Service / Coconino National Forest

Mike Chaveas, former Acting District
Ranger
Mike Elson, District Ranger
Franklin Thomas, Resource Information
Specialist
Yewah Lau, Forest Planner
Jennifer J. Hensiek, Deputy District
Ranger
Jeremy Haines, District Archeologist

National Park Service

Leah McGinnis, Acting Superintendent,
Flagstaff Area Monuments
Diane Chung, former Superintendent,
Flagstaff Area Monuments
Lisa Leap, Chief of Resource
Management, Flagstaff Area
Monuments
Skip Meehan, Office of Planning,
Intermountain Regional Office,
National Park Service
Kat Eisenman, Management Assistant,
Flagstaff National Monuments
Joshua J. Kleinman, Compliance
Archeologist, Flagstaff Area National
Monuments

Coconino County

Liz Archuleta, District 2 Supervisor,
Coconino County Board of
Supervisors
Mandy Metzger, Chair, Coconino
County Board of Supervisors, District
4 Supervisor
Steve Peru
Sue E. Pratt, AICP, Interim Director,
Coconino County Community
Development
Joanne Keene, Government Relations
Director, Coconino County

City of Flagstaff

Bob Caravona
Celia Barotz
Kimberly Sharp, AICP, Acting
Comprehensive Planning Manager,
City of Flagstaff
Jim Cronk

Arizona State Trust Lands

Ed Dietrich (retired)
Mark Edelman
Victoria Carella
Gordon Taylor
Lillian Moodey

Arizona State Forestry Division

Al Hendricks

Arizona Game and Fish

Mark Ogonowski, Urban Wildlife
Planner, Region 2 Office
Rick Miller, retired

AARCHER, Inc.

Jayne Aaron, Planner and Facilitator
Karstin Carmany-George, Archeologist
Wanda Gray Lafferty, Editor
Jim Von Loh, Biologist
Ron Dutton, Socioeconomist
(subcontractor)

HDR, Inc.

Mark West, Website Manager
Nancy Jepsen, Public Involvement
Support

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A:
PUBLIC LAW 111-11, SUBTITLE C – SPECIAL RESOURCE STUDIES,
SEC. 7201. WALNUT CANYON STUDY

THIS PAGE INTENTIONALLY LEFT BLANK

[111th Congress Public Law 11]
[From the U.S. Government Printing Office]

[[Page 123 STAT. 991]]

Public Law 111-11
111th Congress

Subtitle C--Special Resource Studies

SEC. 7201. WALNUT CANYON STUDY.

(a) Definitions.--In this section:

(1) Map.--The term ``map'' means the map entitled ``Walnut Canyon Proposed Study Area'' and dated July 17, 2007.

(2) Secretaries.--The term ``Secretaries'' means the Secretary of the Interior and the Secretary of Agriculture, acting jointly.

(3) Study area.--The term ``study area'' means the area identified on the map as the ``Walnut Canyon Proposed Study Area''.

(b) Study.--

(1) In general.--The Secretaries shall conduct a study of the study area to assess--

(A) the suitability and feasibility of designating all or part of the study area as an addition to Walnut Canyon National Monument, in accordance with section 8(c) of Public Law 91-383 (16 U.S.C. 1a-5(c));

(B) continued management of the study area by the Forest Service; or

(C) any other designation or management option that would provide for--

(i) protection of resources within the study area; and

(ii) continued access to, and use of, the study area by the public.

(2) <<NOTE: Public comment.>> Consultation.--The Secretaries shall provide for public comment in the preparation of the study, including consultation with appropriate Federal, State, and local governmental entities.

(3) Report.--Not later than 18 months after the date on which funds are made available to carry out this section, the Secretaries shall submit to the Committee on Energy and Natural Resources of the Senate and the Committee on Natural Resources of the House of Representatives a report that describes--

(A) the results of the study; and

(B) any recommendations of the Secretaries.

(4) Authorization of appropriations.--There are authorized to be appropriated such sums as are necessary to carry out this section.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B: ACRONYMS AND ABBREVIATIONS

THIS PAGE INTENTIONALLY LEFT BLANK

ACRONYMS AND ABBREVIATIONS

AGFD	Arizona Game and Fish Department
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
cm	centimeter
°F	Degrees Fahrenheit
FLEA	Flagstaff / Lake Mary Ecosystem Analysis
FUTS	Flagstaff Urban Trails System
FY	fiscal year
GMP	General Management Plan
HUC	hydrologic unit code
m	meter
MA 37	Management Area 37
msl	mean sea level
NCA	National Conservation Area
NEPA	National Environmental Preservation Act
NFMA	National Forest Management Act
NPS	National Park Service
RNA	Research Natural Area
RRPA	Renewable Resources Planning Act
USC	United States Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

THIS PAGE INTENTIONALLY LEFT BLANK

**APPENDIX C: CONCLUSIONS FROM AN ASSESSMENT
OF THE NATIONAL SIGNIFICANCE OF CULTURAL RESOURCES FOR
THE WALNUT CANYON SPECIAL RESOURCE STUDY, TED NEFF ET AL.**

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 7: National Significance Assessment of Cultural Resources Properties in the Study Area

The assessment consists of identifying any properties in the study area that are individually nationally significant or identifying a group or cluster of properties that collectively is nationally significant. Regarding this task, due to the temporal affiliation of the vast majority of cultural resource properties in the study area, the focus is generally narrowed to the prehistoric ceramic era. The focus of the groups or clusters assessment is on the high archaeological site density settlement pattern in the study area to the north of WACA. The newly discovered cliff dwellings to the west of WACA are the focus of the individual cultural resource properties assessment. However, historic cultural resource properties are also assessed regarding national significance.

National Significance Assessment of Groups or Clusters of Cultural Resource Properties in the Study Area

MNA sought to identify any clustering of cultural resources properties in the study area that exist independently or are an extension of the cluster or clusters that exist within WACA. This is an important step because if clustering cannot be demonstrated then cultural resources properties must be evaluated individually with respect to National Significance. Both visually (see Figure 6.2) and analytically (see Figures 6.4, 6.6, 6.7, and 6.8) newly and previously recorded sites in the study area to the north of WACA are part of the same cluster. The archaeological sites to the north of WACA within the study area while numerous are relatively humble and would not be considered nationally significant if considered individually. Therefore, in order to be considered nationally significant these sites must be argued as being part of a cluster or group that is collectively nationally significant. Put another way, their national significance relies on their association with the arguably nationally significant cliff dwelling sites in WACA.

Clustering of cultural resources properties must be demonstrated not only spatially but temporally as well. In other words, the majority of the properties in a cluster must have components that are inferred as dating to the same time period for the cluster to be considered appropriate for further analysis. If a cluster of properties is defined from both the spatial and temporal perspectives then the national significance criteria can be applied to the whole.

Utilizing archaeological data provided by NPS and the CNF, data obtained through new archaeological survey, and previous research, MNA was able to define a spatially and temporally discrete cluster of cultural resources properties dating to the Elden Phase (A.D. 1150-1225; see Chapters 3 and 5). The cluster consists of properties along and under Walnut Canyon ledges (the famous cliff dwellings), Fort Sites (open air sites located on “islands” formed by the meanderings of Walnut Creek as it carved Walnut Canyon; see Chapter 2), and open air habitation sites located on immediately adjacent rim areas of Walnut Canyon. Previous research (Acord 2005; Bremer 1988) suggested that this cluster is formed of sub-clusters based on different criteria but the whole may be referred to as the Walnut Canyon village. While it has not been formally assessed, the Walnut Canyon village is clearly nationally significant (see Chapter 3). Other Elden Phase site clusters are present in the Flagstaff area but they are located

outside and to the north of the study area. In the study area, particularly to the north of WACA, previous research and new survey by MNA documented the presence of numerous small sites. Are these small sites part of the aforementioned Walnut Canyon village? The vast majority of these sites date to the A.D. 1076-1150, before the Elden Phase (see Chapter 5). Therefore, based on current information which consists almost entirely of surface survey data, these sites cannot be argued to be part of the Walnut Canyon Village cluster, which date to the later Elden Phase (A.D. 1150-1225). These small sites must be evaluated individually and none of them merit a national significance designation. In sum, current evidence indicates that the boundary of the Walnut Canyon village is subsumed within the boundary of WACA and does not extend into the study area.

National Significance Assessment of Individual Cultural Resource Properties in the Study Area

The newly discovered cliff dwellings to the west of WACA are the focus of the national significance assessment from the individual cultural resource properties perspective. Eight of the 12 documented sites form a visually apparent spatial cluster (see Figure 5.1). However, from the temporal perspective the cluster is not coherent, particularly (only dateable generally to the Sinagua era) in comparison to the Elden Phase (A.D. 1150-1225) Walnut Canyon Village cluster. Therefore from the national significance perspective we evaluated these sites from the individual cultural resource property perspective. At first blush these properties appear to be potentially nationally significant. Because of this, a line-by-line, so to speak, consideration of these properties is warranted. Below text from the 1999 National Register Bulletin, Section IV (how to evaluate and document national significance for potential national historic landmarks), on how to prepare national historic landmark nominations is quoted at length in italics (the actual criterion language is presented in bold) followed by our assessment. It is important to note that: (1) These criteria are only applicable to the designation of a new National Park Service unit and that a cultural resource property(s) only need to meet one of the criteria in order to be considered nationally significant; and (2) WACA was established by Presidential Proclamation before NHL criteria had been articulated, however, because this assessment is about NHL criteria, we consider the Elden Phase Walnut Canyon Village within WACA to be nationally significant.

NHL Criterion 1:

Properties which are associated with events that have made a significant contribution to, and are identified with, or that outstandingly represent, the broad national patterns of United States history and from which an understanding and appreciation of those patterns may be gained.

The events associated with the property must be outstandingly represented by that property and the events be related to the broad national patterns of U.S. history. Thus, the property's ability to convey and interpret its meaning must be strong and definitive and must relate to national themes. The property can be associated with either a specific event marking an important moment in American history or with a pattern of events or a historic movement that made a significant contribution to the development of the United States.

The property that is being evaluated must be documented, through accepted means of historical or archeological research, to have existed at the time of the event or pattern of events and to have been strongly associated with those events. A property is not eligible if its associations are merely speculative. Mere association with historic events or trends is not enough to qualify under this criterion. The property's specific association must be considered of the highest importance.

Based on surface evidence the newly discovered cliff dwellings cannot be firmly temporally associated with the nationally significant Elden Phase Walnut Canyon village already encompassed by WACA, they can only be inferred to date generally to the Sinagua era, and therefore a national significance claim for them cannot be made under NHL Criterion 1.

NHL Criterion 2:

Properties that are associated importantly with the lives of persons nationally significant in the history of the United States.

MNA's founder, Harold Colton, could be argued to be nationally significant in the intellectual history of the United States (see Chapter 3) because he articulated the concept of the Sinagua culture and its attendant intellectual implications and legacy. Following from this, all archaeological sites that can be inferred as having Sinagua cultural affiliation are associated with Harold Colton. However NHL Criterion 2 states, "...associated importantly..." indicating that not just any association is nationally significant, only important ones. Harold Colton is not known to have had specific knowledge of the newly discovered cliff dwellings while he was formulating the Sinagua concept. So the newly discovered cliff dwellings were not important in the formulation of the Sinagua concept. From the perspective of importance to concept formulation the newly discovered cliff dwelling sites are not nationally significant under NHL Criterion 2. However, logically, it should be noted that if one considers every archaeological site with a Sinagua cultural affiliation to be "...associated importantly..." with Harold Colton then a case could be made for the national significance of all archaeological sites with Sinagua cultural affiliation.

NHL Criterion 3:

Properties that represent some great idea or ideal of the American people.

A national significance claim for newly discovered cliff dwellings cannot be made under NHL Criterion 3 because while Harold Colton and the Sinagua concept could be argued to be nationally significant in the intellectual history of the United States the concept has not gone on to become a great idea or ideal of the American people.

NHL Criterion 4:

Properties that embody the distinguishing characteristics of an architectural type specimen exceptionally valuable for a study of a period, style, or method of construction, or that represent a significant, distinctive and exceptional entity whose components may lack individual distinction.

This criterion's intent is to qualify exceptionally important works of design or collective elements of design extraordinarily significant as an ensemble, such as a historic district. It applies to properties significant for their physical design or construction, including such elements as architecture, landscape architecture, and engineering. The property must clearly illustrate the physical features or traits that commonly recur in individual types, periods or methods of construction. A property also must clearly contain enough of those characteristics to be considered one of the best representatives of a particular type, period, or method of construction. (Characteristics can be expressed in terms such as form, proportion, structure, plan, style, or materials.) A building or structure is a specimen of its type or period of construction if it is an exceptionally important example (within its context) of design or building practices of a particular time in history. The language is restrictive in requiring that a candidate be "a specimen exceptionally valuable for the study of a period, style, or method of construction" rather than simply embodying distinctive characteristics of a type, period, or method of construction. With regard to historic districts, an entity must be distinctive and exceptional. This criterion will not qualify all of the works of a master, per se, but only such works that are exceptional or extraordinary. Artistic value is considered only in the context of history's judgment in order to avoid current conflicts of taste.

The question regarding Criterion 4 is: Are the newly discovered cliff dwellings exceptionally important examples of the Walnut Canyon cliff dwelling architectural style, which is argued to be nationally significant above as a part of the Elden Phase Walnut Canyon village and which is encompassed by WACA.

"One of the best", "exceptionally important", and "rather than simply embodying distinctive characteristics of a type, period, or method of construction", these are the phrases used in Criterion 4. Frankly, when compared to some of the largest and best preserved cliff dwellings in the Walnut Canyon village, the newly discovered cliff dwellings are not "one of the best" examples nor are they "exceptionally important" in defining the Walnut Canyon cliff dwelling site type or architectural style.

It is important to distinguish between the general pattern of the Walnut Canyon cliff dwelling site type and architectural style and the specific entity of the Walnut Canyon village which contains a cluster of cliff dwellings dating to the Elden Phase (A.D. 1150 – 1220). We argue above that the Elden Phase Walnut Canyon village is nationally significant and that it is currently encompassed by WACA. To be compared to Walnut Canyon village, a newly discovered cliff dwelling would need to date to the Elden Phase. If the newly discovered cliff dwelling was only generally Sinagua in cultural affiliation without a firm temporal affiliation and it "simply embodied distinctive characteristics of" the Sinagua Walnut Canyon cliff dwelling "type, period, or method of construction" then it would not be nationally significant because the Criterion 4 language is restrictive to "exceptionally valuable".

Because of the lack of firm temporal affiliation with the Elden Phase (A.D. 1150 – 1220), a national significance claim for newly discovered cliff dwellings cannot be made under NHL Criterion 4.

NHL Criterion 5:

Properties that are composed of integral parts of the environment not sufficiently significant by reason of historical association or artistic merit to warrant individual recognition but collectively compose an entity of exceptional historical or artistic significance, or outstandingly commemorate or illustrate a way of life or culture.

This criterion is meant to cover historic districts such as Williamsburg, Virginia; New Bedford, Massachusetts; or Virginia City, Nevada, which qualify for their collective association with a nationally significant event, movement, or broad pattern of national development. Most historic districts that are nationally significant for their extraordinary historic importance, rather than for their architectural significance, are recognized by this criterion.

Criterion 5 uses terminology like “exceptional” and “outstandingly commemorate”. Further this criterion is about historic districts that are nationally significant because of their historic importance rather than their architectural significance. As has been alluded to, the important historic event or time period is the Elden Phase. We can not specifically infer Elden Phase temporal affiliation to the newly discovered cliff dwellings, therefore they would need to qualify under Criterion 4 (“One of the best”, “exceptionally important”, and “rather than simply embodying distinctive characteristics of a type, period, or method of construction”), which they do not.

A national significance claim for newly discovered cliff dwellings cannot be made under NHL Criterion 5.

NHL Criterion 6:

Properties that have yielded or may be likely to yield information of major scientific importance by revealing new cultures, or by shedding light upon periods of occupation over large areas of the United States. Such sites are those which have yielded, or which may reasonably be expected to yield, data affecting theories, concepts and ideas to a major degree.

Criterion 6 was developed specifically to recognize archeological properties, all of which must be evaluated under this criterion. Properties being considered under this criterion must address two questions:

- 1) what nationally significant information is the site likely to yield? and*
- 2) is the information already produced nationally important?*

Answers to both questions must be well documented and logically organized. In order to establish the national significance of an archeological resource, it must be demonstrated how the data has made or will make a major contribution to the existing corpus of information. This criterion requires that potentially recoverable data are likely to substantially modify a major historic concept, resolve a substantial historical or anthropological debate, or close a serious gap in a major theme of American history. It is necessary to be explicit in demonstrating the connection between the important information and a specific property. The discussion of the property must include the development of specific important research questions which may be answered by the data contained in the property. Research questions can be related to property-

specific issues, to broader questions about a large geographic area, or to theoretical issues independent of any particular geographic location.

The current existence of appropriate physical remains must be ascertained in considering a property's ability to yield important information. Properties that have been partly excavated or otherwise disturbed and that are being considered for their potential to yield additional important information must be shown to retain that potential in their remaining portions.

Properties that have yielded important information in the past and that no longer retain additional research potential (such as completely excavated archeological sites) must be assessed essentially as historic sites under Criterion 1. Such sites must be significant for associative values related to:

- 1) the importance of the data gained or*
- 2) the impact of the property's role in the history of the development of anthropology/ archeology or other relevant disciplines.*

“Major scientific importance”, “large areas of the United States”, and “to a major degree”; these are the key terms expressed by Criterion 6. In the NPS NHL Bulletin it states that two questions must be addressed, with an affirmative answer, for properties to be nationally significant:

- 1) What nationally significant information is the site likely to yield?
- 2) Is the information already produced nationally significant?

Regarding the first question, due to the presence of archaeological deposits in sheltered contexts in the newly discovered cliff dwellings it is clear that perishable archaeological resources such as plant parts, textile fragments, string, sandals, basketry, etc. would likely be recovered if excavations were conducted (see Downum et al. 2000). Perishable material is relatively rare in archaeology and this rareness gives these items additional importance because they constitute material culture that is generally not preserved in open-air sites. However, would this material be of major scientific importance in the sense that it would “reveal a new culture, shed light upon periods of occupation over large areas of the United States, or yield data affecting theories, concepts and ideas to a major degree?” Regarding the Sinagua period, it seems unlikely that perishable archaeological resources from the newly discovered cliff dwelling would be of “major scientific importance” or affect “to a major degree” our “theories, concepts and ideas”. It is likely that what would be recovered would be additional examples of what Downum et al. (2000) recovered from the Walnut Canyon village area. Any recovered material would augment a sparse database and that would be a welcome development. However, again, it would be unlikely to change our interpretations to a “major degree”.

In the vicinity of the newly discovered cliff dwellings, a site has been excavated that yielded split twig figurines dating to the Late Archaic period (Schley 1964). This finding suggests that Archaic period material could be a component of archaeological deposits associated with the newly discovered cliff dwelling sites. However, we must balance this speculation with

the reality that the later occupants of the alcoves, the Sinagua, probably heavily disturbed or removed Archaic deposits during the construction and use of their cliff dwellings. The alcove site where the split twig figurines were recovered is unique in that it was not subsequently occupied by later peoples. Further, if additional Archaic period material were recovered would it “substantially modify a major historical concept, resolve a substantial historical or anthropological debate, or close a serious gap in a major theme of American history?” While this is always possible, it seems unlikely based on current knowledge.

In sum, the newly discovered cliff dwellings, based on surface material alone, have not made a major contribution to the existing corpus of information. While the deposits in the newly discovered cliff dwellings are likely to contain perishable Sinagua-aged archaeological resources it is unclear whether this material would significantly change our knowledge of the range of variability pertaining to these items. However, it is possible that it might. There is a possibility that Archaic-aged material is preserved in the newly discovered cliff dwelling sites. Even if this were to be true it is unclear if this material would substantially change our understanding of the Archaic period in the Walnut Canyon area. Again, it is possible that it might. In the end we are left with possibilities that do not measure up to the “major” dictates of Criterion 6.

Finally, regarding a high degree of integrity, the NPS NHL bulletin notes that a property must retain the essential physical features that enable it to convey its historical significance. These essential physical features are those that define both why a property is significant (NHL criteria and themes) and when it was significant. As alluded to above, while the newly discovered cliff dwellings can be inferred to have a Sinagua temporal affiliation, they can not be specifically associated with the Elden Phase (A.D. 1150-1220), which is the time period during which the nationally significant Walnut Canyon village existed. This is because our study was limited to recording surface material only. More research would have to be conducted such as data recovery to recover a larger ceramic assemblage, as well as radiocarbon dating to better determine the age and cultural affiliation of these newly discovered cliff dwellings.

A national significance claim for newly discovered cliff dwellings cannot be made under NHL Criterion 6 based on surface evidence.

National Significance Assessment of Historic Cultural Resource Properties in the Study Area

In assessing whether lands within the study area should be included in a new NPS unit, the character, condition, and significance of historic cultural resource properties must be considered. Documented sites primarily include camps that housed logging and construction crews, logging railroad alignments, and short-term camps for hunting or recreation. The size and condition of these sites varies widely, but most retain enough intact features or artifacts that they can be assigned to a temporal period and often to a specific function. Many of these sites reflect activity important in local and regional economic development, especially those related to logging and ranching. Much of Flagstaff’s early history involved development of these extractive industries, including construction of numerous sawmills, logging camps, and miles of temporary railroad grade to transport logs. Indeed, logging and forestry was a crucial aspect of the region’s economy through the middle of the twentieth century (Cline 1976, 1994).

Despite their association with these regionally-important economic activities, none of the known historic resources within the study area can be considered nationally significant based on criteria stipulated for designation of National Historic Landmarks (see above). Even sites that retain relatively well-preserved artifact assemblages, which can be used to securely date and assess site function, do not manifest characteristics of national significance. One site that might qualify as nationally significant for context and construction technique, the Santa Fe Dam, is not in Federal jurisdiction and is thus not subject to this assessment. None of the known historic resources are nationally significant as an individual property, nor do the sites present a cumulative district that could be considered nationally significant. This does not diminish their importance in providing evidence of the rich and enduring history of the region, but it does not support the establishment of a new NPS unit.

Summary Statement Regarding the Assessment of the National Significance of Cultural Resource Properties in the Study Area

In sum, based on previous research and the analysis of existing and newly acquired archaeological data, MNA argues that no nationally significant cultural resource properties are present in the study area outside of WACA. Given this, based on an appraisal from solely the cultural resource properties perspective, Interior/NPS cannot suggest a new NPS unit as management option for the study area.