



The Plan for Managing Pumphouse Natural Area

**To protect, preserve, and enhance the wetland and
wildlife habitat values of Pumphouse Wash and provide
for compatible recreation and educational uses.**

Coconino County Parks & Recreation, 2009

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

TABLE OF CONTENTS

MAP: PUMPHOUSE WASH MANAGEMENT ZONES

PLAN SUMMARY

SECTION ONE: BACKGROUND

SECTION TWO: NATURAL RESOURCES

SECTION THREE: CULTURAL RESOURCES

SECTION FOUR: PUBLIC SAFETY, VISITOR ACCESS, AND WILDLIFE WATCHING

SECTION FIVE: ENVIRONMENTAL EDUCATION AND STEWARDSHIP

REFERENCES:

APPENDIX A: PARK RULES AND SIGNAGE

APPENDIX B: SAMPLE PUBLIC OUTREACH HANDOUTS

APPENDIX C: 2002 VEGETATION SURVEY

APPENDIX D: PHOTOGRAPHS OF SLED HILL ISSUE & 29 DECEMBER 2004 FLOOD

CREDITS

COUNTY LEADERSHIP:

MATTHEW RYAN, DISTRICT THREE SUPERVISOR

STEVE DRUMRIGHT, PARKS & RECREATION COMMISSION VICE-CHAIR

BRIAN BLUE, PARKS & RECREATION COMMISSION CHAIR (KACHINA VILLAGE)

STEVE PERU, COUNTY MANAGER

TODD GRAEFF, CCPR DIRECTOR

PLANNING TEAM:

GEOFFREY GROSS, CCPR PROJECTS COORDINATOR

CYNTHIA NEMETH, CCPR RECREATION & EVENTS MANAGER

REGINA SALAS, CCPR PUBLIC OUTREACH COORDINATOR

ALEX WISNIEWSKI, CCPR MAINTENANCE MANAGER

JAN BUSH, CCPR PLANNING & ACQUISITIONS MANAGER (PROJECT MANAGER) (2009)

RESOURCE SPECIALISTS:

SARAH REIF, ARIZONA GAME & FISH DEPARTMENT HABITAT PROGRAM MANAGER

SHANNON YOUNG, COCONINO COUNTY ANIMAL MANAGEMENT OFFICER

PHOTOS:

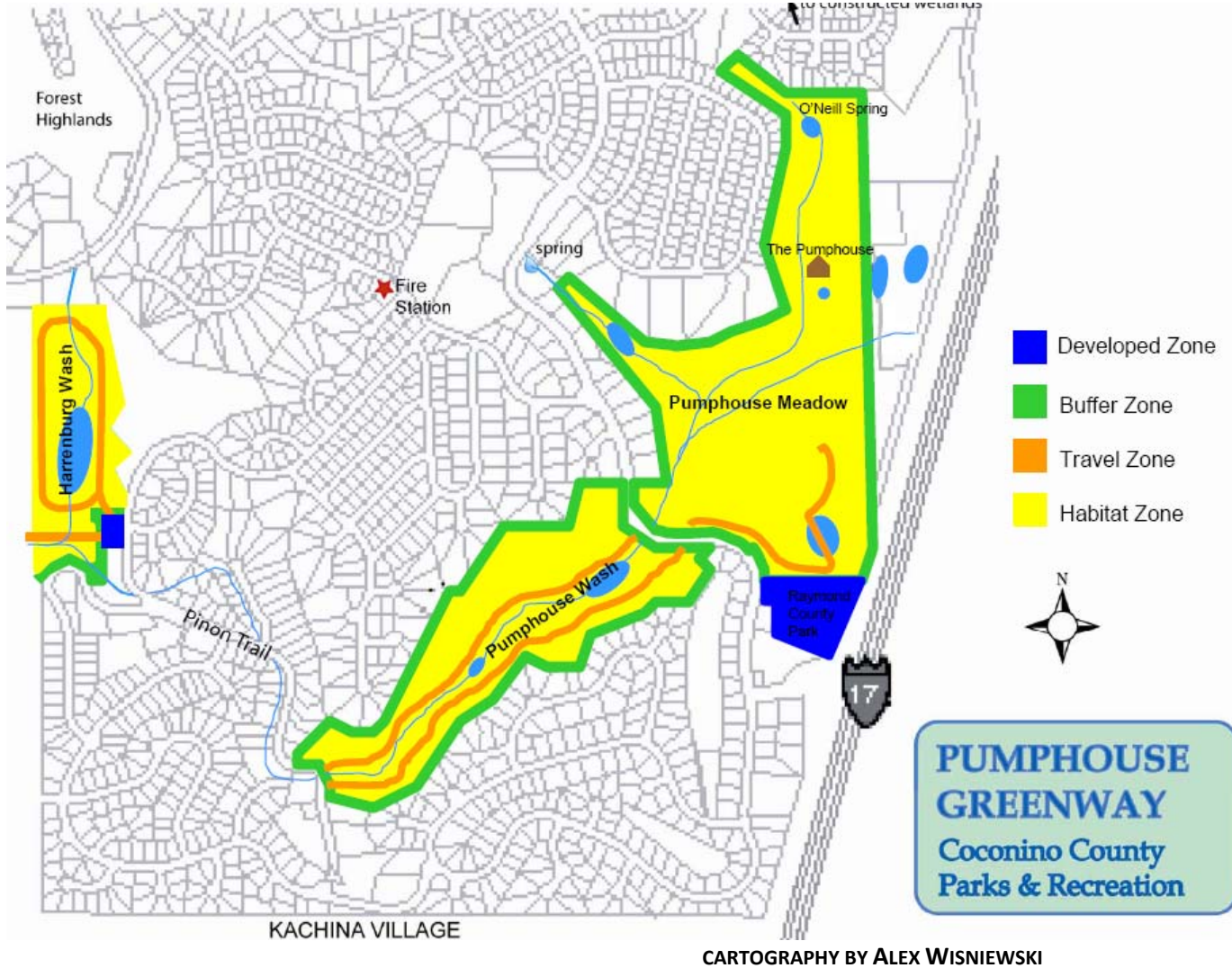
GEOFFREY GROSS, CCPR PROJECTS COORDINATOR

KEVIN VAN HORN, CCPR FACILITIES SUPERVISOR MAP OF PUMPHOUSE WASH MANAGEMENT ZONES

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010



PLAN SUMMARY

PARK SIGNIFICANCE & PURPOSE

Pumphouse Wash, located three miles south of Flagstaff, is the first natural area park in the County park system. Approximately, 2500 Kachina Village residents view the Wash every day. Residents are very protective of it and strongly support efforts to conserve the wetlands, washes, and wildlife that use them. The Wash is named for a small stone pump house located in the wet meadow that is the park's signature viewshed. The meadow is a rare landscape type on the Coconino Plateau, a high-elevation wet meadow fed by springs and seeps.

GOAL OF THIS MANAGEMENT PLAN

To protect, preserve, and enhance the wetland and wildlife habitat values of the Pumphouse Wash system and provide for compatible recreation and educational uses. (Source: 2008 Kachina Village Area Plan Update)

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

PROPOSED POLICIES FOR MANAGEMENT

1. The County shall pursue opportunities to acquire properties that protect and buffer the Pumphouse Wash ecosystem and improve the scenic viewshed.
2. The wetlands of the Pumphouse Wash shall be permanently protected for their natural values and functions.
3. The County shall seek out opportunities to better understand the native biodiversity, hydrology, and ecosystem functions.
4. The County shall strive to maintain and restore pre-1960 hydrology, plants, wildlife, and fish in Pumphouse Wash.
5. The County shall pursue appropriate partnerships and collaboration in the development of restoration and management plans for Pumphouse Wash.
6. The County shall provide for public access and outdoor recreational opportunities to experience and enjoy Pumphouse Wash in ways that are compatible with resource protection.
7. The County shall encourage active citizen involvement in the stewardship of the natural resources of Pumphouse Wash.
8. The County shall enforce the pet leash law at Pumphouse Wash.
9. The County shall engage partners in developing a natural science center for the outdoor study of wildlife, wetlands, and water resources by area neighbors, teachers, and kids.

PROPOSED MANAGEMENT ZONES

This plan proposes to designate functional areas or zones within Pumphouse Wash and manage each for different purposes. The proposed zones are shown on the Map of Pumphouse Wash Management Zones (see page 3). Four zones have been identified, based on visitor use patterns, wildlife needs, and areas with significant vegetation or wetland values. The zones will be managed according to the following guidelines for development and use:

- Developed zone—recreational amenities provide for informal play, picnic areas, restroom building and vehicular parking; high level of contact with other visitors; moderate level of recreational programming; low probability of encountering wildlife; utilities from sustainable sources wherever possible; night lighting based on security needs. Impervious surfaces accommodate intended uses and are associated with stormwater management/storage as necessary to protect the adjacent wetland.
- Travel zone—recreational amenities provide for sightseeing, viewing wildlife, walking, biking, horseback riding and vehicular parking; high probability of viewing wildlife; medium contact with other visitors; low level of recreational programming; no night lighting; pervious surfaces only.
- Buffer zone—provides for boundary management of potential incompatible uses such as encroaching structures and unauthorized trails. No development. Fencing and/or vegetation create well-defined boundaries. No public access except during structured visits under supervision of staff or other authorized personnel.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

- Habitat zone—provides for management of protected wildlife habitats. No new development. No public access except during structured visits under supervision of staff or other authorized personnel.

PRIORITY PLANNED ACTIONS BY ZONE

Travel Zone Priority Actions
Install trail monitors to establish level of annual use.
Install waste cans and dog waste stations at trailheads and access points.
Install information kiosks, at least one for each parking lot; design, fund, and install adequate signage along trails.
Actively promote responsible visitor behavior as being <i>walk on the brown, stay off the green; leave no trace; and leash your dog visitor.</i>
Stabilize the pump house structure until restoration can be executed.
Buffer Zone Priority Actions
Conduct yearly monitoring of boundaries and address emerging encroachment problems.
Fund and install boundary fencing between Pumphouse Meadow and adjacent private parcels.
Establish a chapter of Friends of Coconino County Parks for Pumphouse Wash to help with stewardship activities.
Habitat Zone Priority Actions
Monitor KVID sewer lines and road outfall areas annually for new impacts.
Establish a collaboration with USGS and AGFD to monitor surface hydrology.
Adopt management policies to protect the natural area from development and misuse.
Place the natural area under a permanent conservation easement.
Acquire remaining key parcels to (1) protect hydrology and viewshed; and (2) locate appropriate visitor and educational services.

RELATIONSHIP TO RAYMOND COUNTY PARK

Pumphouse Wash abuts the eight-acre Raymond County Park that was originally built in the 1950s and recently underwent a complete redevelopment. The park provides many recreational facilities including a softball field, basketball court, climbing wall, picnic ramada, restroom building and trail access to a wildlife viewing platform for the Kachina Wetlands. This plan treats Raymond County Park as a separate park facility from Pumphouse Wash due to the differences between their purpose and management. Raymond CP is classified as a community park that serves the neighborhoods of Kachina Village and nearby Mountaineer. Programming at Raymond CP is for outdoor recreation with a focus on informal youth and family activities. Management is consistent with a developed zone (see discussion above).

HOW THIS PLAN WAS DEVELOPED

Staff held eight meetings during FY09 to explore issues and opportunities. Resource specialists Sarah Reif, Habitat Manager with Arizona Game & Fish Department, and Shannon Young, Animal Management Officer with Coconino County Health Department, provided invaluable insights and resources. The plan team appreciated their time and support. Draft materials were reviewed with an eye to integration, clarity and brevity. The draft plan will be vetted with the

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

department's management team, the Parks & Recreation Commission, plan stakeholders, interested members of the Kachina Village community, and the County Board of Supervisors. At each step, staff will review major findings/recommendations, and solicit input to edit the plan.

NEW NAME PROPOSED

The plan team recommends the name *Pumphouse County Natural Area* to more accurately communicate the nature and purpose of the park.

SECTION ONE: BACKGROUND

SITE DESCRIPTION

Pumphouse Wash is comprised of three distinct and discontinuous riparian areas. Acquisitions to assemble nine parcels that form the Wash began in 2000. Donations of private land and grant assistance of \$910,000 from Arizona State Parks Heritage Fund has been used to augment County funds from the Coconino Parks & Open Space Program of just over \$1 million.

The signature landscape, *Pumphouse Meadow*, is a 66-acre spring-fed riverine wetland. Its location between Kachina Boulevard and Tovar Trail just west of Interstate 17 makes it a highly visible scenic vista for both residents and travelers alike. As part of the northern reach of the Verde River Watershed this high-elevation wetland is a rare landform in Arizona and provides exceptional habitat for wildlife. The meadow also holds the historic pump house for which the watershed is named and O'Neil Spring that provided water to Flagstaff lumber mills. Management of an unauthorized social trail along the north edge of the meadow is discussed in this plan.

Pumphouse Wash, a 38-acre site immediately downstream of the meadow, has a different morphology entirely—a distinct stream channel with adjacent wetland hydrology. Wooded slopes on each side of the wash are part of the zone, as is a paved county road, Piñon Trail. This zone has an existing half-mile recreational trail designed for wildlife watching that includes interpretative signs and two viewing blinds. Management of an unauthorized sledding hill is discussed in this plan.

A mile west and north, *Harrenburg Wash* is a 16-acre site at the confluence of Pumphouse Wash. Flows here are intermittent and confined to a highly disturbed area that includes a pond, breached earthen dam, and a channelized reach. It joins Pumphouse Wash in a location that is also channelized, stabilized, and confined by its proximity to Kachina Village Improvement District (KVID) waste-water treatment facility that is located on fill material immediately adjacent to the confluence. The need to restore hydrology in the lower reach of Harrenburg Wash is discussed in this plan.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

HISTORY OF PUBLIC INPUT AND PLANNING

1996 Survey of Residents. The County's Community Development Department distributed a questionnaire to residents as part of its Kachina Village Area Plan completed in 1997. Respondents felt that "Protection of floodplain areas is important, and approximately 70% think that the best way to preserve floodplain areas is to leave them as is with no construction permitted."

2001 Park Master Plan. Public meetings sponsored by the Coconino County Parks and Recreation Department (CCPR) were held in January 29 and February 26 (39 and 14 persons attended respectively). An NAU Parks & Recreation Management class facilitated public involvement and produced a master plan that was approved by the County Board of Supervisors (date?). The plan called for acquisitions, park improvements at Raymond County Park, and trails and plantings for Pumphouse and Harrenburg washes.

2007 WRP Project. A public meeting held July 18 was attended by over 70 persons. AGFD and USDA Natural Resources Conservation Service assisted the County in presenting a proposal to permanently protect Pumphouse Wash by enrolling 100+ acres in the Wetland Reserve Program (WRP). The plan was endorsed by the County Board of Supervisors in August 2007.

2007 Community Survey. An update of the Kachina Village Area Plan acquired data on residents' views. 34% of respondents use the National Forest, Wash, or Raymond County Park for wildlife viewing on a daily basis, with 30% using these areas for daily dog walks. Fully 85% of respondents were very concerned or concerned that wetlands and creek habitats be protected. The 2008 Kachina Village Area Plan Update adopted by the Board of Supervisors on May 20, 2008 includes the Wash in its discussion of natural environment and parks/recreation.

2009 ORGANIZATIONAL MASTER PLAN

Coconino County Parks and Recreation Organizational Master Plan adopted by the Board of Supervisors in 2010 classifies Pumphouse Wash in these ways:

Park type:	natural area (133 acres)
Programming:	protection and education
Management:	level 3 maintenance
Length of stay:	two hours
Public access:	restricted/guided use of signature resources while protecting against harmful human activities
Interpretation:	natural and cultural resources; responsible recreation
Development:	limited to trailheads and multi-use trails; limited to no lighting; center for outdoor education proposed

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

Public input obtained from the master plan's survey of county households was that the top priority for new programming should be environmental and nature education. These recommendations from the plan apply to Pumphouse Wash:

- Diversify department programs to include environmental stewardship and outdoor adventures, thereby engaging a larger group of citizens in outdoor recreation and education.
- Develop a nature science center at Pumphouse Wash in collaboration with partners.
- Buffer parkland from incompatible adjacent land uses.
- Establish trailways to create connectivity between county parks.

SECTION TWO: MANAGING NATURAL RESOURCES

RESOURCE VALUES

Pumphouse Wash is a rare landform in Arizona and the Southwest, a high-elevation wetland. Historically, only 1% of Arizona was wetland habitat and one-third of that area was lost to land and water development between 1780 and 1980. Pumphouse Wash contributes to local, regional, and global biodiversity because wetlands provide necessary habitat at some point in the life cycle of 80% of Arizona's wildlife species. "The value of the ecosystem function provided by wetlands belie their small area. They can profoundly affect the natural vitality of a region" (Integrated Natural Resources Management Plan for Naval Observatory--Flagstaff Station 2007 draft report).

The wet meadow at Pumphouse Wash is primarily spring-fed. O'Neil Spring is in a draw just north of the historic pump house. The Pipeline Springs are located up a draw on the northwest side of the meadow. These two springs provide the majority of the baseflow. The third set of springs is located in rock outcroppings between Tovar Trail and the I-17 right-of-way to the northeast of the meadow.

As a wetland within a pine forest landscape, Pumphouse Wash supports forest wildlife populations with its plants, insects, snakes, birds, rodents, and amphibians. For the woods around Kachina Village this means views of migrating birds including shorebirds, songbirds, hummingbirds, swallows, hawks, and 22 species of ducks. Bald eagles, bats, fox, coyote, and herds of bull and cow elk all use at Pumphouse Wash at some point in their life cycles because of its diversity of plant and aquatic life and because of the water oasis it provides in the heat of the summer.

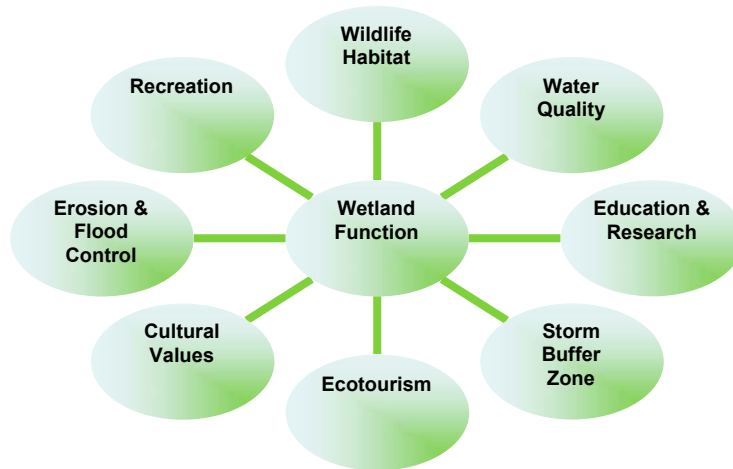
Pumphouse Wash provides another public benefit—it manages our water resource. It traps and holds sediments, nutrients, cinders, and pollutants entering the watercourse from surrounding development. It accommodates and absorbs flood water. It may contribute to shallow aquifer recharge. Pumphouse Wash is considered the headwater of Oak Creek that is a major tributary of the Verde River.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

*DIAGRAM PROVIDED BY S. REIF, ARIZONA GAME & FISH DEPARTMENT
RECREATIONAL AND RESOURCE CONNECTIVITY*



Highland Trail. This County trail connects Kachina Village with Fort Tuthill County Park and the Flagstaff Urban Trails System (FUTS). It is a two-mile-long single-track trail designed for non-motorized recreation and commute users that terminates at Kachina Wetlands.

Kachina Wetlands. Kachina Village Improvement District (KVID) operates a constructed wetland facility known as Kachina Wetlands to dispose of effluent and provide wildlife habitat for migratory waterfowl. KVID makes public access available by agreement with Arizona Game & Fish Department. A segment of the Highlands Trail will be built through Kachina Wetlands.

Wildlife Migration Corridors. AGFD as part of a larger wildlife linkages study tracks the movement of individual elk using radio collars. Kachina Village is part of AGFD Linkage Zone #23 that connects with Munds Park above the Mogollon Rim and Oak Creek below the rim. AGFD map below displays movement of elk #13 in the vicinity of the Wash.

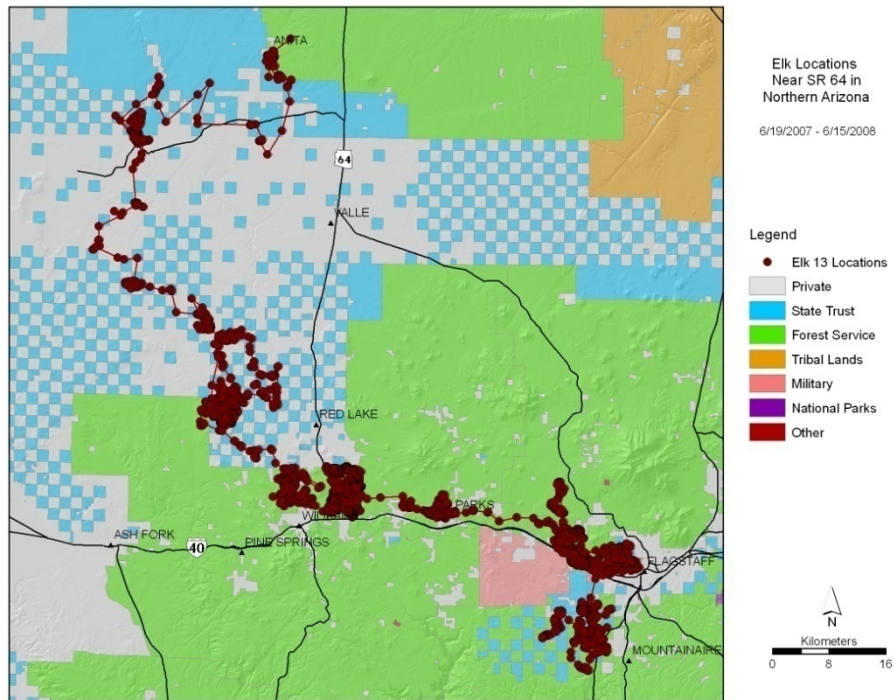
Oak Creek/Verde River. Pumphouse Wash acts as the headwaters of Oak Creek, a major tributary of the Verde River that is visited by 300,000 tourists yearly. Water quality and quantity in Oak Creek is of concern to thousands of downstream residential and agricultural users as well as a million water customers in metropolitan Phoenix who consume Verde River supplies averaging 300,000 acre-feet.

Coconino National Forest and Trails. Kachina Village is surrounded by the Coconino National Forest (CNF). The forest environment is a key asset to residents, a third of whom claim to visit the Forest on a daily basis.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010



URBAN IMPACTS

It is ironic that the high-value wetland habitat of Pumphouse Meadow probably contributes to high roadkill rates along Interstate 17 near the Kachina Village exit. Transportation routes and residential development ring the Meadow and present formidable barriers to wildlife movement into and out of the Meadow. Roads and homes contribute to unmanaged stormwater that causes soil erosion and water pollution. Winter road maintenance results in cinder deposition that produces changes in stream shape, stream depth, and vegetation composition. Transportation and residential areas surrounding the Wash are incubating zones for invasive plant seeds including diffuse knapweed, scotch thistle, barnyard grass, cheat grass, reed canary grass, toad flax, and clovers.

Recreation in Pumphouse Wash also impacts wildlife and wildlife habitat. Residents above the Meadow have developed an unauthorized social trail, use of which discourages wildlife from that area. This user-created trail causes erosion, weeds and, most importantly, wildlife disturbance. Meadow neighbors report that pet owners who let their dogs run off leash often harass or kill wildlife, destroy nests and eat eggs. Unauthorized access to off-trail areas of Pumphouse Wash for snowplay and frisbee golf causes erosion, trash, and trampling. Activity at the sled hill creates public safety concerns and significant congestion along Kachina Trail. Wildlife watching in the same area results in congestion, disturbance to wildlife, and safety issues for visitors who threaten wildlife by approaching them. Dumping of non-native fish and crayfish degrades streams and ponds.

Development of water, sewer, and power infrastructure since 1965 has left visual and functional scars at Pumphouse Wash. Power lines criss-cross the Meadow and gravity-fed sewer pipes are present in all three management zones. Probably the greatest loss of wetland habitat occurred

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

in Harrenburg Wash at the confluence with Pumphouse Wash. Years ago, that confluence was filled by the property owner, Kachina Village Fire District (predecessor to Highlands Fire District) to accommodate training exercises. Currently the last reach of Harrenburg Wash is a narrow, high-banked channel that terminates at a small wetland area. The original extent of the wetland at the confluence is not known but may have been as large as several acres.

Subdivisions of Coconino County government have expressed interest in future development at Pumphouse Meadow. Public Works Department seeks a flood control structure to minimize future damage to homes along Pinon Trail and Pinon Ovi. KVID seeks a well-water site in the Meadow. CCPR has expressed serious reservations about these plans. It will be increasingly important to acquire data about the Meadow wetland and to engage local experts and decision-makers in a science-based analysis and interpretation of these issues. Completion of plans to retire the Wash's development rights through a conservation easement to the Arizona Game and Fish Department would/may protect these areas from undesirable utility development and inappropriate recreation uses.

RESTORATION PROJECTS

Three grants have been received for restoration and enhancement of habitat:

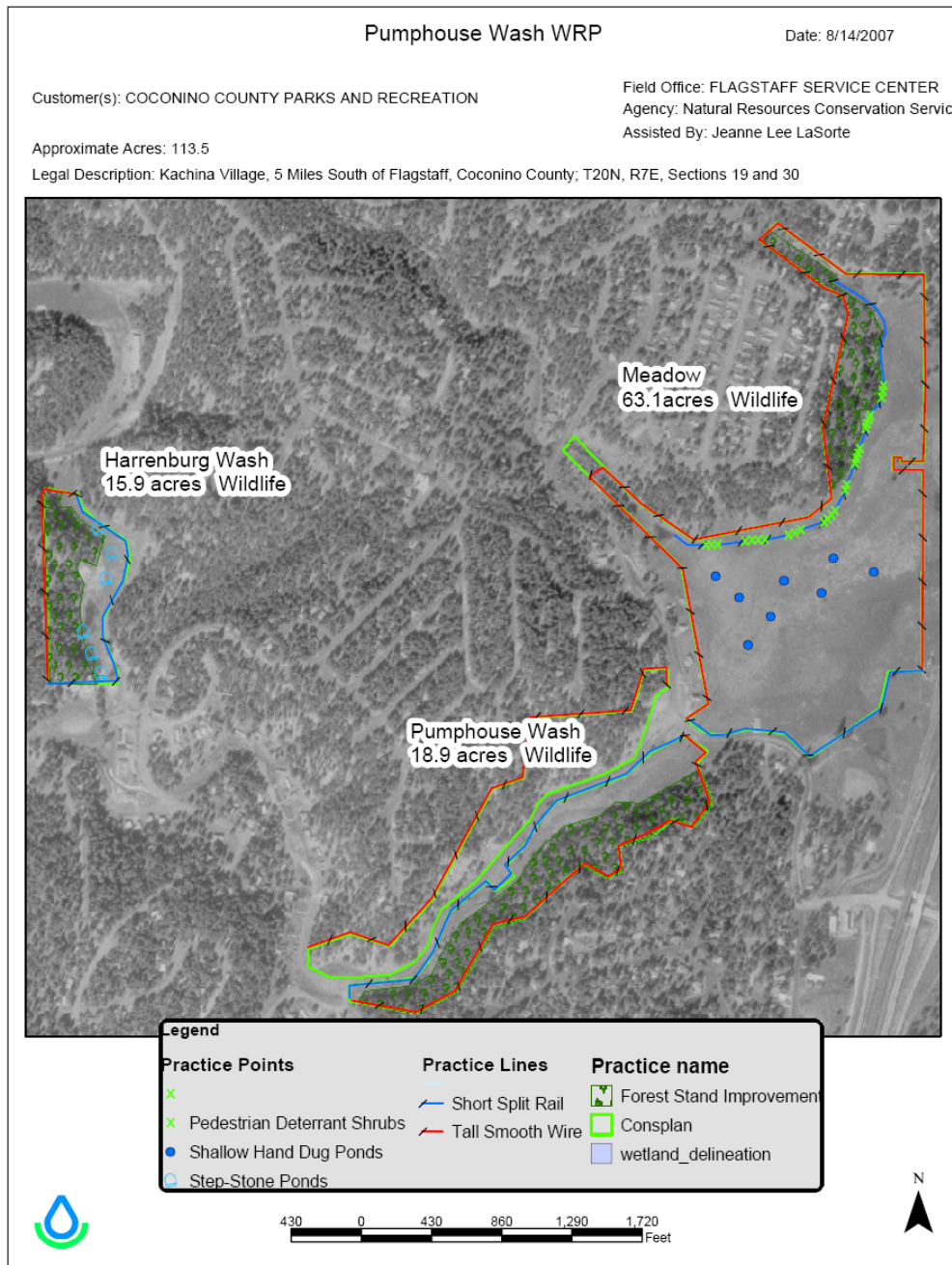
- Pumphouse Wash Habitat Restoration, NAC Five Star (2001-2) \$10,000
- Pumphouse Canyon Habitat Restoration, AGFD (2001-3) \$53,317
- Pumphouse Wash Habitat Enhancement, AGFD (2004) \$23,000

From 2004 to 2008, the department worked with Natural Resources Conservation Service (NRCS) to permanently protect the Wash through enrollment in the Wetland Reserve Program. The County was ultimately denied access to the program, but NRCS accomplished significant planning for habitat restoration and enhancement. The map below shows the location of fencing, plantings, and shallow-water potholes to address access and habitat issues. NRCS completed a hydrologic engineering field study in February 2008 with detailed findings and recommendations.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010



Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

PLANNED ACTIONS:

The top priorities for managing natural resources at Pumphouse Wash are protecting hydrologic characteristics, and improving wildlife habitat and habitat connectivity.

Water resources

- Establish a collaboration with USGS to create protocol and resources to monitor surface hydrology.
- Apply to ADWR to certify an instream flow right at Pumphouse Meadow and a stockpond right at Raymond pond.
- Work with local scientists and land managers to write a plan to restore water resources and wetland habitat.
- Work with KVID and Coconino County Public Works to prevent sedimentation, chemical contamination, and other impacts to wetland.
- Work with AGFD and KVID to restore the confluence of Pumphouse Wash with Harrenburg Wash to its former size and function.
- Stay alert to opportunities for research about groundwater-surface water connectivity and impact of groundwater pumping and surface diversions on the wetland.

Vegetation

- Plant native shrubs including narrow leaf cottonwood and willow for better bird habitat.
- Apply research from AGFD on controlling crawfish and bullfrogs as it becomes available.
- Collaborate with Friends of Coconino County Parks and Friends of Flagstaff's Future to support a PG Watch group, canvas residents to support stewardship, and conduct volunteer weed pulls, trash pick-ups, and tree plantings.

Wildlife

- Use low-head fencing and vegetation such as native rose in high-impact locations to visually delineate the protected wetland and discourage at-will access.
- Replace boundary fence on north side of meadow; remove unnecessary fences in meadow.
- Stay alert to opportunities to partner on research about populations of amphibians, reptiles, bats and birds.
- Track ADOT plans for wildlife connectivity across Interstate 17; actively support efforts to create a wildlife crossing.
- Work toward restoration of native fish populations in meadow.
- Work with ADWR, AGFD, and USFWS toward a roundtail chub catch-and-release fishery at Raymond Pond.

Land Protection

- Continue discussion regarding donating a conservation easement to AGFD to permanently protect the Wash's wetland habitats and water resources.
- Purchase fee simple interest of selected parcels abutting Pumphouse Meadow.
- Rezone parcels to OS (Open Space and Conservation) classification.
- Participate in review of forest and county development proposals.
- Approach abutting landowners about donated conservation easements.
- Ask Forest Highlands for a donated trail easement to improve connectivity between Harrenburg Wash and other parts of Kachina Village.

Pumphouse County Natural Area Management Plan

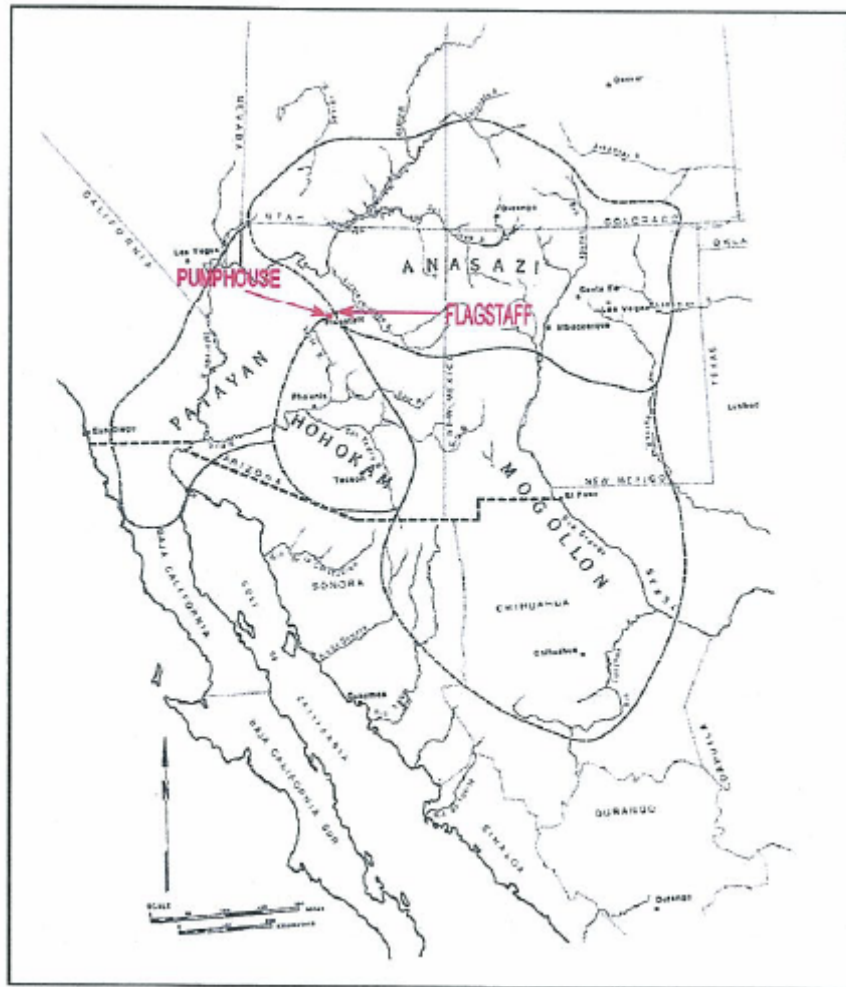
Draft May 21, 2009

Revised December 1, 2010

SECTION THREE: MANAGING CULTURAL RESOURCES

THUMBNAIL HISTORY

First users. Flagstaff and Pumphouse Wash are located at the confluence of prehistoric cultural traditions called Patayan, Hohokam, Anasazi (Ancestral Pueblo) and Mogollon. The map below is from Linda Cordell's 1984 *Prehistory of the Southwest* as modified by Kelso and Eskew in their 2008 cultural resources survey of Pumphouse Wash. Oral history from the Yavapai Apache Indian Community records that the Pumphouse Wash area was used for camping and hunting by Apaches coming and going out of the Verde Valley to Dzil Cho (the San Francisco Peaks) and to trade at Hopi. The Tonto Apache name for the area is Place of Many Springs, or Tu'ha das nLi'l'. The Apache were masters of the 'leave no trace' ethic; the landscape has no remnants of their stay.



Pump House Ranch. Homestead certificate #222 was issued to William D. Black in 1891 for the 160-acre northeast quarter section of Section 30. Coconino Cattle Company (1906-1938) sold the land to Dr. R. O. Raymond. Dr. Raymond was very fond of his "Pump House Ranch" that included portions of Section 20 on the east side of I-17. Raymond's employee and partner, Frank

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

Auza, moved sheep between the ranch and Woody Spring near Rogers Lake. Raymond's estate sold all but the five-acre gravesite to the developers of Kachina Village. The County acquired the area in a series of donations and transactions, most occurring since 2000.

Harrenburg Wash. The Harrenburg Wash area was patented by George W. Black in 1895 when he claimed the east half of the northwest quarter of Section 30. He conveyed the property to James Vail and the land was bundled into the Vail estate bought by Coconino Cattle Co. The County acquired the Wash in two transactions: a gift from the predecessor of Highlands Fire District, and a land-for-debt swap with KVID.

Dolan's Meadow. The entire Section 19, where the Pump House is located, was patented to the Atchison Topeka Santa Fe Railway in 1902. Joseph Dolan, bought it from the Railway in 1945 and resold it to the company of which he was an officer, Arizona Lumber and Timber (AL&T), in 1947. AL&T sold out to developers of Kachina Village in 1965, reserving the "O'Neil Spring Parcel" in the southeast quarter section. That parcel was sold by the trustee of AL&T in 1992 and acquired by the County in 2004.

The pipeline. The Atchison, Topeka & Santa Fe Railway filed a right-of-way easement across Section 19 for a cast iron pipeline in 1905. Two springs supplied water to ponds built in the wet meadow, one of which is still functional. The pipeline went past the site of the current Amphitheater at Fort Tuthill and on in to Flagstaff where it terminated at Phoenix Avenue. The railway sold water to Flagstaff lumber mills and, during dry years, to the city itself.

Kachina Village. A planned residential community was proposed in 1965 and marketed in Phoenix as recreation-oriented, vacation property. The developer chose cultural elements of the Hopi Tribe to create an identity for the "Kachina Village Country Club Village." Plans called for a gated, high-end development with an 18-hole golf course, clubhouse and stables. By 1971, the Tucson developer filed for bankruptcy. Open spaces that are now Pumphouse Wash avoided development, although periodic proposals for commercial or residential projects at the meadow created a vigilance among residents that is still in play.

2008 CULTURAL SURVEY

Natural Resources Conservation Service (NRCS) conducted a cultural resources survey of Pumphouse Wash and published its findings in October 2008. The report has a wealth of information about prehistoric cultures that lived in the area. It inventories several cultural sites and numerous isolated artifacts. It provides a detailed photographic and narrative description of the pump house and cistern.

THE HISTORIC PUMP HOUSE

The NRCS cultural survey describes the Meadow's pump house area as an historical-era archaeological site that consists of a mortared stone pump house and cistern with associated features and artifacts. The report estimates the structure to have been built between 1902 and 1920. The pump itself was manufactured after 1916. NRCS advises that the site meets two National Register criteria for significance and is eligible for nomination onto the National Register of Historic Places. "The pump house, cistern, and pump largely retain their integrity of location, design, setting, materials, workmanship, feeling and association and are associated with development of the railroad and timber industries that dominated the economic and social

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

history of the Flagstaff area during the late 19th and early 20th century” (Kelso and Eskew, 2008, p. 31). The report will be a valuable resource for writing a nomination not to mention interpreting Pumphouse Wash’s history.

PLANNED ACTIONS

- Right away, block the doorway to the pump house using a gate design that matches the window rebar closures (to protect it from further vandalism); repair the large crack in the mortar above the door sill; replace broken or missing facing boards beneath the roof eaves; correct failing foundation at the southeast corner.
- Apply to register the pump house with the National Register of Historic Places
- Develop a plan for restoring the pump house; identify local specialists to assist with materials and labor, and estimate a budget.
- Ask Friends of Coconino County Parks to match grant funds for restoring the pump house and developing an interpretive trail.
- Design/install an historical trail around the pump house to relate early Flagstaff history; use artifacts such as old fence posts made from railroad ties to bring early economies and lifestyles into focus.
- Identify local resource specialists such as Kachina resident and tribal archaeologist Chris Coder to help interpret prehistoric cultural information.

SECTION FOUR: MANAGING PUBLIC SAFETY, VISITOR ACCESS & WILDLIFE WATCHING

TRAFFIC CONGESTION AND WILDLIFE-PEOPLE INTERACTIONS

The local expression “elk jam” refers to the crowds of folks who stop and watch wildlife in Pumphouse Meadow. These park visitors are described as oblivious to traffic safety concerns or the wildness of the animals whose space they crowd. The photos below were taken at Kachina Trail in August 2002. A fence, now gone, prevented visitors from getting too close.



Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010



NATURAL HAZARDS: WILDFIRE AND FLOODING

Natural hazards threaten Kachina Village residents' safety and property. Wetlands are natural detention areas with significant capacity to store temporary flood water. Their capacity can be overwhelmed when development occurs in the upper watershed. This is the case in Pumphouse Wash where Forest Highlands subdivision is upstream of Kachina Village. Significant flooding occurs at Pumphouse Wash about twice in a decade, most recently in September 2003 and December 2004. See photos at Appendix D.

Wildfire, racing up from Oak Creek Canyon or spreading from the surrounding Coconino National Forest, could also threaten residents' safety and property. The Forest's priority management goal is to reduce the threat of a large and destructive fire. Highlands Fire District operates a local program to help residents thin their residential lots of dense tree growth. Within the Wash, thinning has occurred in the woods to the southeast of Pumphouse Wash along Pinon Trail.

PARK VISITORS WHO HARASS WILDLIFE

Meetings with abutting landowners along Pumphouse Meadow in July 2007 raised numerous concerns for both the public's safety and the safety of wildlife that visit Pumphouse Wash. Neighbors observed visitors who watch elk in Pumphouse Meadow and approach the animals much too closely. They expressed alarm at the increase in harassment of wildlife, particularly elk and nesting waterfowl. They described many incidents of loose dogs chasing elk onto local roads and Interstate 17. They reported dogs destroying the nests of ducks and migratory birds. They also complained about trespass through their private properties by park visitors who want to watch elk.

RECREATION IMPACTS

Recreation is sometimes written as *wreak-reation* to acknowledge the problems that people create for the natural world in the process of enjoying it. At Pumphouse Wash, careless or

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

irresponsible wildlife watching produces both human safety issues and an unacceptable level of wildlife disturbance. Neighborhood dogs, that are permitted to roam freely or that accompany park visitors off-leash, harass wildlife and pollute water with their waste. Snowplay causes erosion, trash, endangers public safety, trampling, and congestion of the roadway. When park visitors create informal trails, they inadvertently disturb wildlife, cause soil erosion, and distribute weed seeds. Concentrated off-trail use degrades fragile wetlands and woodland slopes. These recreation impacts are discussed in more detail in the following sections.

DOGS AS PARK VISITORS

Domestic dogs that accompany park visitors into wildlife habitats may create disturbance, harassment, displacement, or direct mortality of wildlife (Sime, C.A. 1999, Domestic Dogs in Wildlife Habitats). They transmit or receive diseases including rabies, distemper, and parvovirus when they come in contact with wildlife. Dog feces are picked up in rainwater runoff and carried into stream channels as a pollutant. Dogs maintain their instincts to hunt and, given an appropriate stimulus, chase their prey. Studies indicate that many grazing species experience more distress from unanticipated disturbances such as a dog off-leash than from other kinds of activity. Dogs can force movement of the animals in direct conflict to their overwinter survival strategy of conserving energy or their summertime need to avoid strenuous activity in the heat. Dogs prey on wildlife nests and young during the summer nesting season.

Coconino County does have an ordinance (2007-03) that prohibits dogs from running at large and allows for fines to owners for a class two misdemeanor. Fines range from \$25 to \$750. The ordinance is valid for public property in unincorporated areas whether it owned by a local, state, or federal jurisdiction. It applies to public streets, sidewalks and alleys. The dog is to be restrained by a leash that is not more than six feet long and strong enough to control the dog's behavior. Injuries to any person or animal (domestic or wild) caused by a dog while running at large are the legal responsibility of the dog owner.

SNOW PLAY

"The unofficial snow-play area near the intersection of Kachina and Pinon Trails raises serious traffic safety concerns. Parking along the roadways with people milling about creates a very unsafe condition especially when combined with winter road conditions. If sledding and snow-play activities are going to be permitted to continue at this location, a designated parking area should be provided and roadside parking restrictions should be enforced" (2008 Kachina Village Area Plan Update). The sledding area, called "suicide hill" locally, does attract reckless behavior. See Appendix D photos of damage caused to the creek channel in January 2007 when a truck was driven across the wash and toward the hill. Highlands Fire District reports that it responded to five non life-threatening accidents at the sled hill over a five-year period. Statistics from an emergency room or ambulance service have not been obtained.

After consultation with the County Attorney in November 2007, the department changed its approach to managing the sled hill. Signs stating "No Sledding" were posted and the County Sheriff was asked to enforce the no-parking zone along Kachina and Pinon Trails. However, use of the sled hill continues, causing traffic problems and personal accidents.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

UNAUTHORIZED TRAILS

Pumphouse Meadow has an unauthorized social trail, located at the base of the wooded slope along the north side. It is so well used that it shows up on aerial photographs. The trail gives nearby residents direct access into the wetland from properties that abut the meadow parcel. Even though the trail does provide users a way to enjoy the Meadow its frequent use continues to cause erosion, wildlife disturbance, and distribution of weed seeds.

PLANNED ACTIONS

Traffic Congestion/Parking

- Provide adequate places for visitors to park and watch wildlife compatible with natural resource protection; specifically (a) complete construction of watchable wildlife trail at Raymond County Park that includes parking, viewing scope on platform, interpretive signing, fencing, trail to viewing blind, and connection to canyon trail; (b) continue discussions with adjacent landowner about a park 'n view at their property; and (c) design a watchable wildlife station on the west side of the meadow near Kachina Trail bridge.
- Work with Kachina Village multimodal plan to reduce parking congestion along Kachina Trail.
- Coordinate with Public Works and Kachina Village Multimodal Plan team on a trail crossing at Kachina Trail to improve connectivity between Raymond County Park and the Pumphouse Wash trail.

Natural Hazards: Wildfire & Flooding

- Schedule thinning for slope above Pumphouse Meadow with the goal of maintaining quality habitat and aesthetics; meet with neighbors beforehand.
- Re-assess woodland thinning needs for the habitat zone every five years.
- Work with NRCS and Public Works to address the cause of the head cut that is working up channel from Kachina Trail bridge and threatens to undermine the capacity of the meadow to store flood water and sustain its sheet flow dynamic.
- Work with NRCS to design a repair of the overflow channel at Raymond Pond.
- Collaborate with Public Works on a natural restoration of eroded bank adjacent to bridge over Pumphouse Wash at Tonalea Trail.
- Work with Kachina Village Multimodal Plan team, AGFD, and Public Works to evaluate whether the three bridges along Kachina and Pinon Trails are of inadequate size and design to manage low and bank-full flows.

Harassing Wildlife

- Encourage County Health Department and Sheriff's office to enforce the pet leash law. Dogs are permitted if on-leash and under owner's complete control. Owner must pick up dog's refuse.
- In order to provide adequate places for visitors to park and watch wildlife compatible with natural resource protection, (a) complete construction of watchable wildlife trail at Raymond County Park that includes parking, viewing platform, viewing blind, and fence; (b) continue discussions regarding areas for a park 'n view adjacent to the Meadow; and (c) design a wildlife viewing station..
- Ask Friends of Coconino County Parks to develop a fundraising program to support wildlife watching stations.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

- Use low-head fencing and vegetation such as native rose in high-impact locations to visually delineate the protected wetland and discourage at-will access.

Snowplay

- Coordinate efforts to address sledding at Pumphouse Wash to explore alternative sites for a sledding hill to serve families with small children.

Public Access

- Adopt park rules for Pumphouse Wash (proposed list at Appendix A).
- Develop signage and brochure material about responsible recreation habits.
- Install waste cans and dog stations at trailheads or along trails.
- Encourage Sheriff's office and Health Department to enforce the leash law in Pumphouse Wash. Dogs are permitted, on-leash and under owner's complete control. Owner must pick up dog's refuse.
- To reduce impacts to wildlife from use of the social trail along the north side of the meadow, consider (a) lowhead fence and plantings to establish a clear protective boundary for the wetland edge; (b) seasonal closure of the trail using gates; (c) access the feasibility of a viewing station above O'Neil Spring and/or westerly pond; or (d) tie in trail access from O'Neil Spring draw to Kachina Wetlands.
- Complete public access, parking lot, and loop trail for Harrenburg Wash in collaboration with KVID.
- Request that ADOT install signs at Intersection of Exit 333 and I-17 to advertise the two County Parks in Kachina Village.

SECTION FIVE: MANAGING ENVIRONMENTAL EDUCATION & STEWARDSHIP

A PHILOSOPHY OF ENVIRONMENTAL EDUCATION (EE)

"We are in the 'Gameboy Era' where children know more about electronics and the indoors than they do about the natural world. As children lose their connection to nature, we lose our future community of environmental stewards and conservation voters," says Sarah Reif, AGFD. Sarah likes a quote from Richard Louv's book, *Last Child in the Woods*, because it captures the big-picture cost of permitting kids and adults to become alienated from the natural world:

"Nature-deficit disorder is not an official diagnosis but a way of viewing the problem, and describes the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses. The disorder can be detected in individuals, families, and communities."

Connecting *people to nature* is what Coconino County Parks & Recreation does. With educational opportunities in the environment, the goal is to build positive experiences and accurate information through direct interactions with the outdoors. Over time, kids and adults get hooked. Curiosity and pleasure replace unease or indifference. The quest for one's personal connection to and responsibility for the environment is grounded upon many, many pleasant experiences close to home. Starting with direct positive experiences instead of dwelling on the environmental damage has one big payoff: it makes people feel a part of the solution instead of being the problem.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

The proposed goal for an environmental education program at Pumhouse Wash is to connect people to the natural world through activities that steward the Wash and through positive, interactive programs that focus on wildlife, wetlands and water.

Neighborhood stewardship. Pumhouse Wash runs through a suburban community of 2500 people. What could be better than a stewardship program to match the size of the challenge? Since it takes a whole village to protect an urban wetland, why not involve hundreds of community members in conserving its natural and cultural values? Programs about finding and watching wildlife will be popular. Many adults get satisfaction from planting trees, pulling weeds and hauling trash. Some will find monitoring water quality and water quantity to be rewarding. Another approach is to invite parents to participate with their kids in educational activities.

Environmental education. The model that suits Pumhouse Wash is of an indoor/outdoor learning facility that specializes in interactive outdoor programs. Making wildlife, wetlands, and water the primary foci takes advantage of the very special wetland and riparian areas that are within walking distance. The planned network of park trails and wildlife viewing areas that are intended to be explored on one's own would complement this focus. In addition to working with families from the community, the program should train teachers, interns, and retirees to provide students with science experiences that match their learning needs.

EXISTING AND PLANNED FACILITIES

Current facilities include a half-mile interpretive trail above Pumhouse Wash and a floating bridge at Raymond Pond. Kachina Wetlands and Highland Trail are off-site assets that may expand options for interpretative and stewardship activities (see Section Two on recreational and resource connectivity).

Future plans call for two new areas to watch wildlife that come to the meadow. Construction of a viewing platform and blind accessible from Raymond County Park was completed in 2010 with a \$10,000 grant funding by the AGFD's Watchable Wildlife Program. A second plan is under discussion with neighbors adjacent to the Meadow. to create a mini wildlife viewing/parking area adjacent to their ponds on Tovar Trail.

Improved public access is also in the works for Harrenburg Wash. The department has an agreement with KVID to develop existing informal parking and trailhead access to the Forest into a well-designed public parking lot and trailhead. The department also plans a loop trail above Harrenburg Wash that will give visitors quiet places to watch wildlife in the wash without disturbing them.

USEFUL FUTURE FACILITIES

Indoor Environmental Education Classrooms. Effective educational experiences for youth and adults often start indoors, move outdoors for interactive experiences, and then return indoors for recap. An indoor environment to support such a pattern will have many of these features:

- Interactive learning stations for children
- Educational displays for adults and children on topics such as

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

- Pumphouse Wash as Verde River headwaters
- Importance of springs and wetlands in Arizona
- Wetland bugs and bats
- Pumphouse Wash's wildlife and tips for finding them
- Importance of forests to wetland health
- Living well in the interface between urban and wild
- Water conservation and reuse
- Presentation space for educational programs and community meetings
- Office for environmental education coordinator and volunteers
- Additional resources like field guides, wildlife information resources, county park information, living with urban wildlife information, and merchandise sales

Outdoor. Outdoor facilities would provide experiential learning opportunities for children and adults:

- Roundtail chub fishery for youth at Raymond Pond
- Bat house display
- Pollinator garden

A CULTURE OF COLLABORATION

The Flagstaff area has a wealth of environmental education service providers. These include Camp Colton, Willow Bend Environmental Education Center, NAU Summer Bug Camp, Life Draw, The Flagstaff Arboretum, and the local chapters of Arizona Association of Environmental Educators and Arizona Audubon. It makes sense to invite these entities to help CCPR build an environmental education center at Pumphouse Wash. By being inclusive, the County will benefit from the resources and strengths of each organization and contribute to the vitality of environmental education regionally.

PLANNED ACTIONS

Stewardship

- Focus outreach activities on building individual experiences with the wetland environment that are positive, useful, informative, and engaging.
- Sponsor annual events for residents to pick up trash, weeds, frogs and crayfish.
- Establish a chapter of Friends of Coconino County Parks for Pumphouse Wash to monitor wetland functions and assist with education programs.
- Bring a stewardship theme to the annual community picnic at Raymond Park.

Environmental education (EE)

- Carefully define an educational niche centered on outdoor-based interactive exploration of wildlife, wetlands, and water.
- Engage a wide range of partners in the vision; establish an inclusive approach to utilizing available educational services; work with partners' strengths.
- Study a select set of facilities that can provide guidance, such as Pima County, Montana Audubon Conservation Education Center, and Aspen Center for Environmental Studies.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

- Identify grant opportunities such as AGFD Heritage Fund to provide a three-year pilot program with paid staff/volunteer coordinator
- Pursue opportunities to purchase a facility for environmental education.
- Ask Friends of Coconino County Parks to fundraise for an EE center.
- Examine the range of “off the shelf” curricula including Focus Wild Arizona (AGFD), Let's Go Outside (US/FWS), the Children and Nature Network, Project Wet, and Project Learning Tree to identify a “starter” curriculum.

APPENDIX A: PARK RULES AND SIGNAGE

PERMITTED AND PROHIBITED ACTIVITIES

- Yes quiet enjoyment *if on trails* via hiking, biking, horse-back, wildlife viewing, photography, snowshoeing, skiing
- No off-trail access, including sledding, snow play, kite flying, frisbee golf, rock climbing
- Yes dogs on trails *if on leash*
- No pet waste
- No harassing wildlife
- No littering or dumping
- No possession or discharge of firearms
- No off-highway vehicles
- No drug use
- No metal detecting
- No hunting
- No plant or rock collection/harvesting
- No rockets or remote control vehicles
- No fires
- No boating

SIGNAGE

Signage is a high-priority action item (see Plan Summary). The plan team recognizes that visitor signage can be used as a key guide for quality visitor experiences and responsible visitor behavior. It recommends that a team approach be used to identify specific needs and develop designs and materials that integrate well into the existing facilities. The sign team should include outside assistance from AGFD and local specialists in interpreting cultural and natural history.

Three park rules should be present on all signs that address responsible park visitor behavior. The rationale for the rules is this:

1. *Walk on the brown, stay out of the green.* Wetlands are fragile habitats and their wild inhabitants are easily disturbed by unexpected human activities. Enjoy the wetland from a sloped area above it. Avoid walking in the wetland unless you are part of a tour guided by park staff.
2. *Put your dog visitor on a leash.* Other park visitors appreciate your effort to protect them, their children, and their dogs. Moreover, Kachina residents appreciate your

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

courtesy toward the wildlife they are so fond of. If you encounter dogs off leash, please call Coconino County Health Department Animal Management Program at 928-679-8756 to report the problem.

3. Leave no trace. When you walk or ride a bike or horse along Wash trails, pack out fruit peels, power bar wrappers, water bottles, and pet feces. The Apache spirits will smile on you.

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

APPENDIX B: SAMPLE PUBLIC OUTREACH HANDOUTS

PUMPHOUSE GREENWAY

Pumphouse Greenway is a 129-acre linear park in Kachina Village (Exit 333, off Interstate-17) that emphasizes the protection of wetland habitat and water resources. The Greenway is the place to see elk, fox, deer, and a large variety of waterfowl and migratory birds. The large wet meadow, visible from I-17, was purchased with funds from the **County Parks and Open Space Program**.

Pumphouse Greenway is best viewed from adjacent Raymond County Park or Piñon Trail, a half-mile trail corridor along the wash below Pumphouse Meadow. Upcoming construction at Raymond County Park will install wildlife viewing platforms and trail above the wet meadow so visitors can enjoy and protect Pumphouse Greenway at the same time. When visitors leash their dogs or enjoy the wetland from high ground, they participate in protecting this rare highland wetland habitat.



Did you know?






Pumphouse Greenway is a spring-fed wetland, one of the rarest wildlife habitat resources in Arizona! As with any wetland, the Greenway has higher biological activity than the surrounding landscape. It attracts a wide variety of wildlife: waterfowl, wading birds, wintering bald eagles, elk, garter snakes, songbirds, and small mammals.

The wet meadow and washes of Pumphouse drainage form the “headwaters” of Oak Creek, a major tributary of the Verde River. When junk gets into the water along Pumphouse Greenway—dog poop, motor oil, or cinders from road maintenance, for instance—it ends up affecting fish, birds, snakes, and mammals that rely on the Verde River corridor for habitat.

The hills and springs that ring Pumphouse Greenway were once a camping and hunting area for Apaches coming and going out of the Verde Valley to **Dzil Cho** (the San Francisco Peaks) and to Hopi to trade. The Apache place name for the area translates as **Place of Many Springs**. Their signature on the landscape is invisible even though they used the area over several centuries. These and other first Arizonans knew so much about sustainability.

Did you know your choices affect Pumphouse Greenway?

Community involvement and education are critical to sustaining good habitat in the Greenway for decades to come. Here's what you can do to help:

-  **Walk on the brown, stay out of the green.** Wetlands are fragile habitats and their wild inhabitants are easily disturbed by unexpected human activities. Enjoy the wetland from a sloped area above it. Avoid walking in the wetland unless you are part of a tour guided by park staff.
-  **Leave no trace** when you walk or ride a bike or horse along the Greenway's trails. Pack out fruit peels, power bar wrappers, water bottles, and pet feces. The Apache spirits will smile on you.
-  **Put your dog visitor on a leash.** Other park visitors appreciate your effort to protect them, their children, and their dogs. Moreover, Kachina residents will appreciate your courtesy toward the wildlife they are so fond of. If you encounter dogs off leash, please call Coconino County Health Department Animal Management Program at 928-679-8756 to report the problem.



928-679-8000
www.coconino.az.gov/parks.aspx





Dogs as Park Visitors to Pumphouse Natural Area

Please put your dog visitor on a leash

Other park visitors appreciate your effort to protect them, their children, and their dogs. Moreover, Kachina Village residents will appreciate your courtesy toward the wildlife they are so fond of.



Keep Your Dog Safe!

Dogs can easily become overheated. Hike or bike with your pet during the cooler times of the day.

Dogs love to run but, just like you, your dog needs to work up to fitness. Start slowly and build your pet's stamina for hiking and biking with you. Be alert for signs of fatigue, injury, and thirst.

Always bring water for your pet. Never leave your dog unattended in your vehicle while you use the park.

All park users depend on you to remove and properly dispose of your dog's waste. Dog waste stations featuring free plastic bags and disposal containers are planned in the near future!

Domestic dogs that accompany park visitors into wildlife habitats may create disturbance, harassment, displacement, or direct mortality of wildlife. They transmit or receive diseases including rabies, distemper, and parvovirus when they come in contact with wildlife. Dog feces are picked up in rainwater runoff and carried into stream channels as a pollutant. Dogs maintain their instincts to hunt and, given an appropriate stimulus, chase their prey. Studies indicate that many grazing species experience more distress from unanticipated disturbances such as a dog off-leash than from other kinds of activity. Dogs can force movement of the animals in direct conflict to their overwinter survival strategy of conserving energy or their summertime need to avoid strenuous activity in the heat. Dogs prey on wildlife nests and young during the summer nesting season.

~ 2009 Management Plan for Pumphouse Natural Area

Coconino County does have an ordinance (2007-03) that prohibits dogs from running at large and allows for fines to owners for a class two misdemeanor. Fines range from \$25 to \$750. The ordinance is valid for public property in unincorporated areas whether it owned by a local, state, or federal jurisdiction. It applies to public streets, sidewalks and alleys. The dog is to be restrained by a leash that is not more than six feet long and strong enough to control the dog's behavior. Injuries to any person or animal (domestic or wild) caused by a dog while running at large are the legal responsibility of the dog owner.

To report an unleashed dog:

Please call Coconino County Health Department Animal Management Program at 928-679-8756.

Dog parks—City of Flagstaff

- Bushmaster Park—3150 N. Alta Vista
- Thorpe Park—191 N. Thorpe Road

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

APPENDIX C: 2002 VEGETATION SURVEY

Pumphouse Wash Vegetation Inventory

Veg Type	Species Name	Common Name	Occurs Naturally	Planted Aug-02
Trees:	<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	X	
	<i>Populus angustifolia</i>	Narrowleaf Cottonwood*	X	
	<i>Prunus virginiana</i>	Common Chokecherry		
	<i>Quercus gambelii</i>	Gambel Oak	X	X
Shrubs:	<i>Amelanchier utahensis</i>	Serviceberry	X	X
	<i>Ceanothus fendleri</i>	Buckbrush*		
	<i>Cornus stolonifera</i>	Red Twig Dogwood*	X	X
	<i>Juniperus communis</i>	Common Juniper		
	<i>Parthenocissus inserta</i>	Thicket Creeper	X	
	<i>Potentilla fruticosa</i>	Shrubby cinquefoil	X	X
	<i>Rhus trilobata</i>	Squawbush		X
	<i>Ribes cereum</i>	Wax Currant*	X	X
	<i>Robinia neomexicana</i>	New Mexican Locust	X	X
	<i>Rosa arizonica</i>	Arizona Rose	X	X
	<i>Rosa woodsii</i>	Wood's Rose*	X	
	<i>Salix exigua</i>	Coyote Willow*	X	
	<i>Salix laevita</i>	Tall Willow	X	
	<i>Salix lasiolepis</i>	Arroyo Willow*	X	X
	<i>Sambucus caerulea</i>	Blue Elderberry*		X
	<i>Symphoricarpos rotundifolius</i>	Snowberry*		X
	<i>Vitis arizonica</i>	Canyon Grape		
Perennials:	<i>Castilleja integra</i>	Indian Paintbrush	X	
	<i>Cirsium</i> sp	Thistle		X
	<i>Commelina dianthifolia</i>	Dayflower		
	<i>Erigeron oreophilus</i>	Fleabane		X
	<i>Eriogonum racemosa</i>	Redroot Buckwheat		X
	<i>Geranium caespitosum</i>	Purple Cranesbill	X	X
	<i>Helianthella quinquenervis</i>	Aspen Sunflower		
	<i>Helianthus annuus</i>	Annual Sunflower		
	<i>Hymenopappus mexicana</i>	Mexican Woollywhite		X
	<i>Ipomopsis aggregata</i>	Scarlet Gilia		X
	<i>Iris missouriensis</i>	Western Blue Flag	X	
	<i>Linum lewesii</i>	Blue Flax	X	X
	<i>Lotus wrightii</i>	Wrights Deervetch		X
	<i>Lupinus argenteus</i>	Silver Lupine	X	
	<i>Monarda menthefolia</i>	Beebalm	X	X
	<i>Oenothera hookeri</i>	Hooker's Evening Primrose		
	<i>Oxytropis lambertii</i>	Lambert's Locoweed		

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

	Penstemon barbatus	Scarlet Bugler	X	
	Penstemon vingatus	Western Penstemon		X
	Potentilla hippiana	Yellow Potentilla		X
	Potentilla thurberi	Thurbers cinquefoil		X
	Rudbeckia laciniata	Cutleaf Coneflower		
	Senecio spartioides	Broom Groundsel		X
	Sidalcea neomexicana	New Mexican Checkermallow		
	Solidago sp.	Goldenrod		X
	Thermopsis pinetorum	Golden Pea	X	X
Grasses:	Blepharoneuron tricholepsis	Pine dropseed		X
	Bouteloua curtipendula	Sideoats Grama		
	Bouteloua gracilis	Blue Grama		X
	Bromis marginatus	Mountain brome		X
	Carex spp.	sedge		X
	Carex utriculata	sedge	X	X
	Elymus canadensis L.	Canada wildrye		X
	Elymus elymoides (Raf.) Sweezy	Squiretail		X
	Festuca arizonica	Arizona Fescue		X
	Festuca ovata	Sheep Fescue		
	Poa fendleriana (Steudel) Vasey	Mutton Bluegrass		X
Other	Antennaria rosulata	pussytoes		
	Arenaria fendleri			
	Blepharoneuron tricholepsis	Pine dropseed		
	Bromis marginatus	mountain brome		
	Muhly montana	Mountain muhly		
	Robena mcdouglii			

Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

APPENDIX D: PHOTOS OF SLED HILL ISSUE & 29 DECEMBER 2004 FLOOD



Pumphouse County Natural Area Management Plan

Draft May 21, 2009

Revised December 1, 2010

The prior two photos documented the destructive nature of attempts to pull a truck from Pumhouse Wash when it attempted to cross the wash to the sled hill and got stuck.

The three photos below document the 29 December 2004 flood. The first photo is taken at the confluence of Harrenburg Wash with Pumhouse Wash (notice the Forest boundary in the background). The second photo shows flood water overtopping Kachina Trail adjacent to Pumhouse Meadow and struggling to move under the bridge. The last flood photo is of Pinon Ovi, a short residential street developed so as to leave the wash no room to handle flood flows.



Pumphouse County Natural Area Management Plan
Draft May 21, 2009
Revised December 1, 2010

