

PROJECT SUMMARY

AXXO holdings is proposing to develop a portion of accessors parcel number is 101-28-005H which is approximately 3.35 acres. The project will be developed as townhomes, to be rented or possibly platted and sold as separate units. The site is currently zoned HR (high density residential). The project will include eight 4-plex buildings, and one 2-plex for a total of 34 units. Each unit will include a one car garage along with 2 bedrooms and 1-1/2 or 2 bathrooms. The parcel to the north is the existing YMCA building zoned HR and the parcel to the south is zoned R1 and is undeveloped. The parcel is bounded to the east and west by North Turquoise Drive and North Switzer Canyon Drive. Across the roads is additional single family lots. A Legal description for the project parcel is included in Appendix A.



Fig 1. Conceptual 4-Plex Unit

UNIQUE APPROACH TO DIFFICULT SITE

The project site is challenging due to constraints across the entire parcel. The steep 2:1 Switzer Canyon Road fill slope encroaches onto the site from the south and west. When the road slope catches grade, native ground slopes around 10% to 13% towards the Switzer Canyon Wash floodplain and floodway. There is a floodplain through the parcel that currently has a Rural Flood Plain Designation, meaning the floodplain should be preserved in its entirety. The entire parcel contains moderate to dense tree coverage. 1.96 acres of the 3.35 acres is in the flood plain. This only leaves around 1.39 acres to hit a minimum density of 34 units at 10 units per an acre. In order to improve buildable densities the project would like to develop approximately 0.36 acres of the floodplain that was mapped with the adjacent YMCA project. In return, the remainder of the parcel starting from the existing utility easement continued east to Turquoise Drive would be deeded over to the city as public open space (approximately 1.37 acres). This would then be combined with the existing open space to the north (2.25 acres) through a lot line adjustment or other instrument. The current concept plan shows 34 units, to provide a DUA of 10 or 17 depending on how the potentially split portion is handled. Additional arguments in support of this proposed rural floodplain mitigation are expanded throughout

RURAL FLOODPLAIN AND ENVIRONMENTAL CONSIDERATIONS

A major feature of the site is Switzer Canyon Wash, which contains a FEMA designated floodplain and floodway. The floodplain is also designated Rural by the City of Flagstaff, although the same floodplain is designated urban both up and downstream of this stretch. Multiple parcels along this stretch of floodplain have been developed in and along the floodplain by elevating building pads out of the true drainage path. There have also been substantial disturbances by underground utilities including the 15" Switzer Canyon Trunk Sewer and the 16" Switzer Canyon Water Line. And more recently a roadway crossing two parcels to the north that constricts runoff through a culvert, negating any true floodplain characteristics.

A Design Report and Biological Evaluation was completed by Natural Channel Design in 2003 that concluded that due to development and the ephemeral nature of the stream this area does not contain suitable habitat for any federally listed species. A copy of the report is in Appendix B.

FLOODPLAIN MAPPING

The FEMA designated floodplain and floodway mapping was the basis for determining the limits of the resource protection area. However more detailed HEC-RAS mapping was done for the wash crossing and YMCA project that better defines the true drainage ways and water surface elevations for the adjacent parcel that conflict with the FEMA mapping. Further analysis may show that existing floodplain isn't even in the proposed disturbance limits due to disturbance from the road crossing and YMCA disturbances. There is also a berm built with the existing water main which creates a cut off isolating the proposed disturbance areas (See Concept NRPP for exhibit). As this project progress, this reach of the floodplain can be redefined using HEC-RAS to determine current limits and verify the project will not have adverse impacts to the floodplain upstream or downstream.

NATURAL RESOURCE PROTECTION PLAN

The project site will preserve 50% of trees across the 3.35 acre parcel boundary and to dedicate 1.37 acres as public open space. The project does propose to disturb the currently mapped rural floodplain, but further investigation show that the area has already been disturbed by a utility easement and is likely never flooded due to the berm created by the utility easement and fill that was brought in with the YMCA project directing runoff to the east towards the existing thalweg. It should also be noted that this portion of floodplain is filled with many medium and young ponderosa pines, meaning that regular "standing water" type flooding of this area does not occur.

STORMWATER

The City requires detention/LID for any commercial development greater than ¼ acre in size. LID policies will require 1" of ROCV to be retained on site along with a water quality component. The project will use underground retention facilities to meet these requirements. Detention may not be required due to being adjacent to the wash.

ACCESS TO SITE

Access to the site is currently provided through an access easement across the YMCA property. Due to grade change, no vehicular access will be provided to Switzer Canyon Drive. The YMCA property has an existing staircase that dead ends at the property line. This will be picked up and an additional staircase will be constructed to connect a pedestrian access up the hill. The YMCA site also provided an ADA ramp stubbed to the property to provide an additional ADA pedestrian connection to Turquoise Drive.

UTILITIES

The site will provide new water meters and sewer services to the units. An additional hydrant will also be added. Water will connect to the 16" main in the wash. Sewer will connect to the 15" main in the wash. Shared dumpster and recycle bins will be located on site.

Townhomes Plat

The developer would like to consider the option of platting and selling the townhomes (condominiums).

CONSTRUCTION LOGISTICS PLAN

The project site is relatively small and will be very tight during construction. The only access to the site is to the north through the access easement in the existing YMCA parking lot. The contractor will need to schedule crews stage by stage as construction progresses in order to minimize the amount of parking needed at one time. There will be no impacts to North Switzer Canyon Drive as part of this project. There will be disturbances in the floodway to connect to the sewer main. These connections will need to be made in the spring or fall and planned around minimal risk of storms. In addition, grading work in general should be planned around winter and monsoon season, and strict erosion control measure implemented until stabilization is reached.

LANDSCAPE AESTHETIC

The site aesthetic and pedestrian experience will be guided through the use of natural materials and native plants. Canopy and ornamental trees will be used to reduce the scale of the buildings at the pedestrian level. Landscape design will be utilized to blend the natural aesthetic preserved on the eastern portion of the property where the new floodplain open space will be preserved. Appropriate native plants will be selected to reflect the amount of space, light, and water available on site.

Appendix A

Old Republic National Title Insurance Company - Issued by**Pioneer Title Agency Inc.****EXHIBIT A****LEGAL DESCRIPTION**

The Land referred to in the policy is described as follows:

The following is a legal description of a parcel of land lying within Section 15, Township 21 North, Range 7 East of the Gila and Salt River Base and Meridian, Coconino County, Arizona, more particularly described as follows:

COMMENCING at a found ½ inch rebar and plastic cap "R. SCHILKE RLS 28230" at the Southwest corner of Parcel 1, as described in Special Warranty Deed recorded at Instrument No. [3220487](#), records of Coconino County, Arizona (herein referred to as R1), and the TRUE POINT OF BEGINNING, and on the North right of way line for Switzer Canyon Road, and on the North-South centerline of Section 15, from which a found ½ inch rebar and aluminum cap "N.E.S. RLS 14671" at the Northwest corner of said Parcel and on said Section line bears North 01° 46' 38" West, a distance of 501.88 feet (measured and basis of bearing for this description) (North 01° 37' 00" West, a distance of 502.27 feet, R1);

Thence leaving said right of way line North 01° 46' 38" West (North 01° 37' 00" West, R1), along said Section line, a distance of 72.78 feet to a set ½ inch rebar and aluminum cap "LS 40640";

Thence leaving said Section line South 90° 00' 00" East, a distance of 291.63 feet to a set ½ inch rebar and aluminum cap "LS 40640";

Thence South 25° 55' 21" East, a distance of 138.95 feet to a set ½ inch rebar and aluminum cap "LS 40640";

Thence South 90° 00' 00" East, a distance of 260.30 feet to a set ½ inch rebar and aluminum cap "LS 40640" on the West right of way line for Turquoise Drive at the beginning of a non-tangent curve concave to the Southwest having a radius of 937.02 feet (R1) and a central angle of 15° 28' 53" and being subtended by a chord which bears South 30° 18' 27" East, a distance of 252.41 feet;

Thence along said right of way line Southeasterly along said curve, a distance of 253.18 feet to a found ½ inch rebar and plastic cap "R. SCHILKE RLS 28230";

Thence leaving said right of line North 89° 34' 00" West, along the South line of said Parcel, a distance of 446.28 feet (North 89° 29' 15" West, a distance of 446.21 feet, R1) to a found ½ inch rebar and plastic cap "RLS 9078" on the North right of way line for Switzer Canyon Road;

Thence along said right of way line North 47° 21' 45" West, a distance of 357.13 feet (North 47° 37' 06" West, a distance of 357.83 feet, R1) to a found ½ inch rebar and plastic cap "R. SCHILKE RLS 28230" at the beginning of a non-tangent curve concave to the Southwest having a radius of 756.20 feet (R1) and a central angle of 02° 52' 59" (02° 52' 51", R1) and being subtended by a chord which bears North 49° 11' 59" West, a distance of 38.05 feet;

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EXHIBIT A
(Continued)

Thence continuing Northwesterly along said curve, a distance of 38.05 feet (38.02 feet, R1) to the TRUE POINT OF BEGINNING.



Appendix B

DESIGN REPORT & BIOLOGICAL EVALUATION

Switzer Wash Project

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January 2003

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PROJECT LOCATION:

The project site lies with the limits of the City of Flagstaff in Coconino County, Arizona. Switzer Wash is an ephemeral stream that begins along the northern flanks of Mount Elden and flows south and eastward to join Butler Wash and the Rio de Flag. The project lies at approximately 7,000 feet in a montane forest of ponderosa pine and oak. The valley floor is dominated by pine, oak, and various bunch grasses. Switzer Wash has a drainage area of approximately 2.5 square miles at the project site. The watershed is relatively undeveloped (forest and low-density residential) in the upper reaches and more urbanized (moderate-density residential and office park) near the project site. The project property is bounded by Forest Avenue to the north, Switzer Canyon Rd and San Francisco Street on the West and Turquoise Drive to the East and South.

The project is located within the corporate limits of Flagstaff, Arizona. The property is bounded on the south and east by Turquoise Drive and on the west by properties lying along San Francisco Street and on the north by Forest Avenue. The specific location of the project is Township 21N, Range 7E, Section 15, NW1/4SE1/4 or N 35° 12' 8.7" and W 111° 38' 13.0" longitude and latitude. See Figure 1 for location.

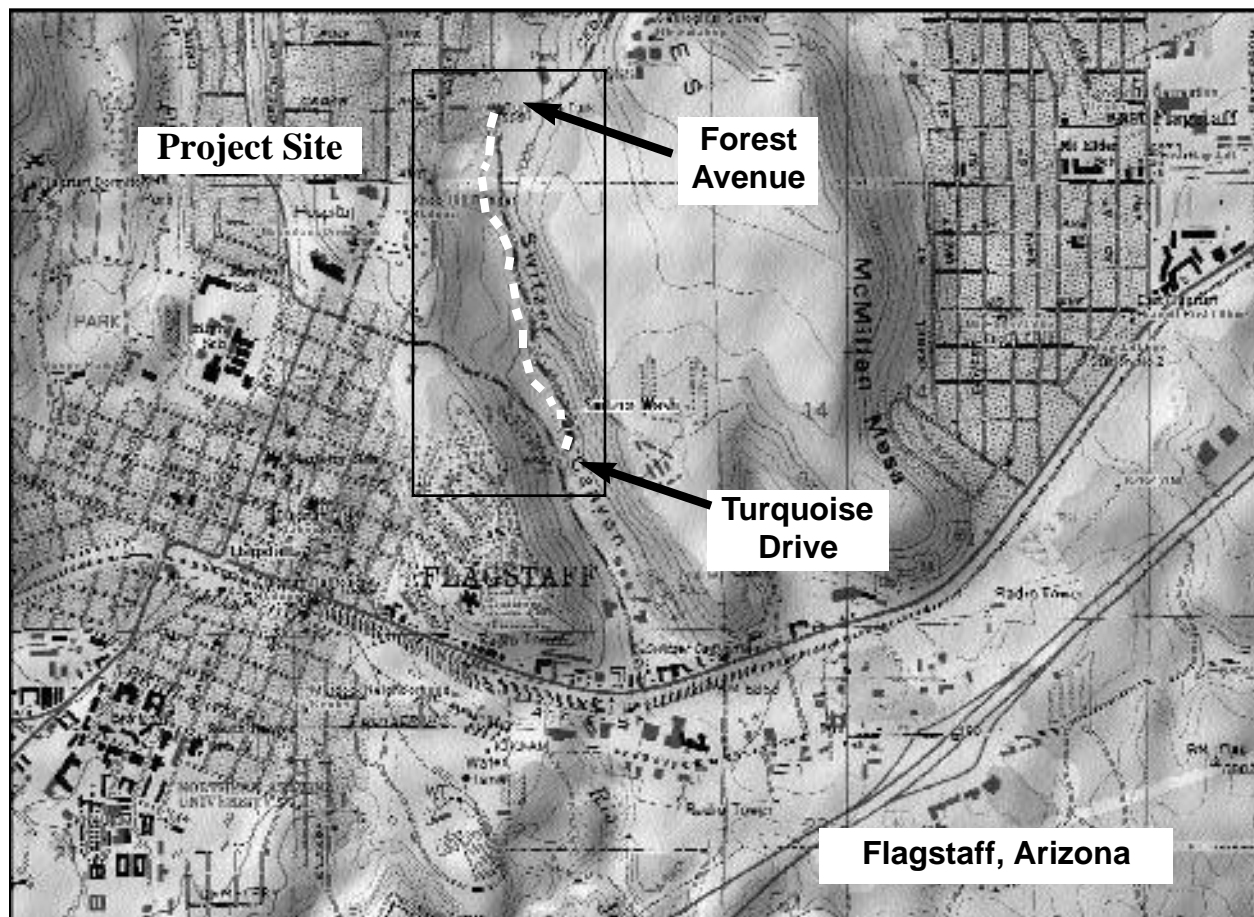


Figure 1. Switzer Wash Project Location

PROJECT PURPOSE:

The purpose of the project is to protect and/or improve the aesthetics and function of the channel and floodplain along 3000 feet of Switzer Wash while development of the surrounding property occurs. The ephemeral stream channel and floodplain will provide aesthetic and pedestrian recreation to surrounding developments. The majority of the project activities within and without the jurisdictional area will be directed toward maintaining and enhancing stream function. Footings for four double-pier vehicle bridges will be installed within the project area to allow vehicle crossing with minimum impact to the watercourse.

The area around the project site is in the process of being developed. Four road bridges crossing the stream channel are planned. However, the development plan intends to protect the wild nature of Switzer Wash by maintaining the open, undeveloped areas around the stream channel and its floodplain. A portion of the city urban foot/bike trail system will run through the valley and pedestrian access near the watercourse will be preserved. A sizeable portion of the valley floor has been transferred to the City of Flagstaff for protection as urban open space.

The project will require footings for four vehicle bridges to be sited adjacent to the the stream channel. In addition, existing spoil piles of rock and rubble will be removed or reshaped to restore natural channel and floodplain geometry. Natural channel dimension will be restored within the existing alignment to two reaches where excessive sediments have created channel braiding. A short section of previously altered channel will be realigned to reduce the sediment loads currently contributed from an existing road embankment. All disturbed areas will be replanted with native grasses, forbs, and woody species as appropriate.

Hydrologic, hydraulic, and geomorphic assessments of the project site have been completed to identify "Ordinary High Water:" and the jurisdictional area. A flow with a return interval of 2.33 years was chosen as "Ordinary High Water" because it includes both the bankfull channel and significant adjacent floodplain. It also statistically represents the Mean Annual Flood flow. Due to its small watershed, that area is a corridor along the stream channel with widths that varies from 16 - 76 feet.

PROJECT APPROACH

The project objective is to enhance biological and physical riparian function and aesthetic values to the project area by removing the direct and indirect impacts of human created modifications to the stream channel and floodplains. The approach was to develop the geomorphic parameters that represent the stable or reference condition for Switzer Wash. Reference conditions were used to evaluate the current conditions of the physical and biological resources. Due to the surrounding urbanization, reference conditions are based on the identification and characterization of functioning portions of the stream channel within the project site. Several representative cross-sections and a longitudinal profile were surveyed. Data at the natural functioning reaches was used to develop reference channel/floodplain dimension. Channel and floodplain restoration will be based on typical design cross-section dimensions (Table 1, Figure 2). For most of the project, channel/floodplain alterations are intended to restore natural dimension previously altered.

CURRENT CONDITION

Not surprisingly for a stream channel in an urban area, there is evidence of considerable human activities along Switzer Wash. A city sewer line, water line, and utilities follow the open valley and frequently cross the channel. Box culverts convey stream flow under roadways at the upper and lower end of the project. It appears that fill has been placed on or near the channel throughout the project over time and large angular rock is common along the edge of roadways and other infrastructure. Two road embankments contribute significant quantities of cinders and other small sediments to the stream channel causing braiding. In spite of these impacts, this reach of Switzer Wash still maintains its riparian function and much of its wild nature.

TABLE 1. REFERENCE CHANNEL/FLOODPLAIN DIMENSIONS AT PROJECT SITE.

	<u>Average</u>	<u>Range</u>
Bankfull Discharge	35 cfs	
Cross-sectional Area	13 sq. ft	11.5 – 14 sq. ft
Max bankfull depth	1.0 feet	0.65 – 1.2 feet
Bankfull width	23 feet	15 – 32 feet
Mean bankfull depth	0.65 feet	0.4 – 0.7 feet
Floodprone width	65 feet	45 – 140 feet
Width/depth ratio	35	30 – 42
Entrenchment ratio	2.5	2.3 – 5.8

Width/depth ratio is defined as bankfull width divided by mean bankfull depth and is a measure of channel shape and sediment transport capacity.

Floodprone width is the floodplain width at an elevation twice maximum bankfull depth and is a measure of stream access to an adjacent floodplain.

Entrenchment ratio is defined as floodprone width divided by bankfull width and is a measure of the stream's ability to access an adjacent floodplain.

(Rosgen, 1996)

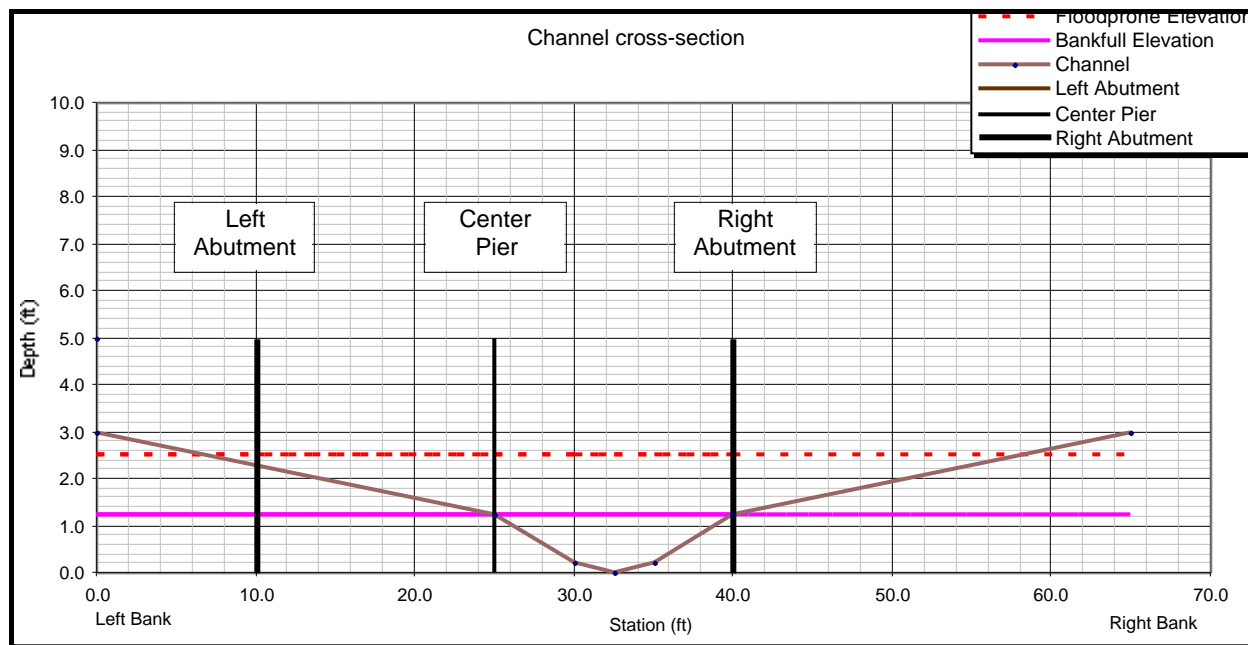


FIGURE 2. DESIGN CHANNEL/FLOODPLAIN CROSS-SECTION

The primary limiting factors to the biological and physical functions of Switzer Creek are direct manipulations of the channel and floodplain during past construction of surrounding roads, utility pipelines, and other infrastructure. In several places the channel and floodplain have been significantly narrowed and/or completely realigned. Large rock has been added to the banks and channel presumably to minimize erosion. Extensive spoil piles limit access to the active floodplain. Steep road embankments contribute to increases sediment supplies. Channel realignments have pushed the channel into dense thickets of Ponderosa pine.

The cumulative impact of these modifications limits the function of the riparian system. Project activities are designed to reverse these conditions.

MITIGATION MEASURES AND POLLUTION CONTROL

Construction will take place to: 1) minimize the chance of flood events, 2) minimize impacts nesting birds, and 3) allow harvesting and planting of local vegetation during or approaching a dormant state.

Excavation equipment can remain outside the channel for most operations. However, operations from the floodplain or terrace will create disturbance to the existing vegetation on these features. All disturbed areas will be reseeded or replanted with native vegetation.

Refueling of all excavation equipment will be restricted to the areas outside the Jurisdictional area and well away from the stream channel.

An archeological survey for cultural resources throughout the project has been completed. However, if any unidentified cultural resources are discovered during construction, all activities will cease until such time as further clearance is given to proceed.

PROPOSED ACTIONS/ASSOCIATED IMPACTS:

Although filling of the channel or floodplain is not the purpose of the project, some discharge will be avoidable during the project. Discharge will occur during the execution of the following activities. All areas referred to in the following descriptions are shown in the aerial photos in Appendix A.

1) CHANNEL RESTORATION:

- a) At “B” an existing headcut will be repaired by installing a low rock weir. The weir will be constructed of native rock and will serve as grade control through the headcut area to minimize future erosion. The top of the structure will remain below floodplain elevation to allow flood flows to spread. Excavation will be completed with a trackhoe and limited to the immediate area around the weir. All disturbed areas will be replanted or reseeded and excess material will be used to fill the headcut or removed from the channel/floodplain area.
- b) Along “C” approximately 250 feet of channel will be realigned to move it 25 feet away from the steep road fill slope. The purpose is to reduce the high sediment loads supplied by the embankment. A trackhoe will excavate a new channel (see Figure 2 for design channel) to design dimensions. Excavated material will be used to construct a floodplain feature along the base of the road embankment. Willows will be planted along the channel to reinforce the bank. All disturbed ground will be reseeded.
- c) Along “D” Some excavation will take place in this area to restore the proper channel dimension to the existing braided channel. Only excavation is expected to be necessary unless there is unsatisfactory substrate beneath the existing channel. In that case appropriate gravel substrate would be brought in to line the channel bottom. The existing channel will be lowered approximately 1.5 feet in elevation to restore a more consistent channel slope and aid sediment transport.
- d) Along “F” a low rock weir will be constructed over an existing pipeline weir. The purpose of the weir will be to recenter stream flow at this point and reduce bank erosion.
- e) The existing channel will be realigned through areas M, N, O, P, & Q. The existing channel runs through relatively thick stands of Ponderosa pine and is often braided and clogged with debris. This almost certainly is not the channels original alignment. It appears that previous filling along Turquoise Drive to the east has forced the channel into the trees. We propose to realign the channel to remain clear of trees and in a more open area. This will entail creating a shallow channel for about 1,000 feet in the new alignment. See Figure 2 for a typical design cross-section. The existing channel will be filled to floodplain elevation using material from the new channel. All disturbed ground will be replanted or reseeded with native vegetation to minimize erosion and sedimentation. This part of the project is included in the urban “Open Space” deeded to the City of Flagstaff.

Associated Effects

Sedimentation Effects: Due to the ephemeral nature of the stream, sedimentation impacts are expected to be short-term and local. All disturbed ground will be replanted or reseeded with native vegetation to minimize erosion and sedimentation.

Machinery Effects: There will be temporary, local disturbance to the projects where excavation takes place. However, these disturbances are the direct result of restoration activities and are designed to improve conditions. All disturbed ground will be replanted or reseeded with native vegetation.

Noise Effects: the use of trackhoes and other machinery will temporarily increase noise levels within the project. However, given the location of the project in a busy urban area, the noise is not expected to be significantly above ambient levels.

Channel Alteration Effects: Excavation and other disturbances along the channel are designed to minimize or eliminate existing impacts. The realignment of the channel will provide a more natural and stable flow of water and sediment. The installation of low rock structures will eliminate erosion and sedimentation at “B” and reduce bank erosion at “F” by centering flow. Overall, channel modifications will remove stressors and restore natural function to the channel.

2) FLOODPLAIN RESTORATION

- a) Along “D” existing spoil piles will be removed and/or reshaped on the floodplain. These piles currently separate the channel from its floodplain and create a split channel during high flows. These actions will restore the floodplain function to this reach. Removal and/or reshaping will be done with heavy machinery and all disturbed areas will be reseeded and/or replanted with native vegetation.
- b) Along “F” existing spoil piles will be removed and/or reshaped on the floodplain. These piles currently separate the channel from its floodplain and create a split channel during high flows. These actions will restore the floodplain function to this reach. Removal and/or reshaping will be done with heavy machinery and all disturbed areas will be reseeded and/or replanted with native vegetation.
- c) Along H, large rock riprap will be selectively removed to aid water/sediment flow and increase aesthetics. Over time large rock has been dumped along banks and floodplain. The rock is much larger than that normally moved by the stream and interferes with water and sediment flow. Individual rocks will be removed by trackhoe stationed outside the channel.
- d) At “N” and “P” existing manholes jut into the active floodplain. Active erosion is occurring around the manholes during overbank flow. The project proposes to fill the area immediately around each manhole to extend the adjacent terrace and reduce erosion. These activities are located away from the active channel. All disturbed areas will be reseeded and/or replanted with native vegetation.

Associated Effects

Sedimentation Effects: These activities will take place outside the active channel. Due to the ephemeral nature of the stream, any sedimentation impacts are expected to be short-term and local. All disturbed ground will be replanted or reseeded with native vegetation to minimize erosion and sedimentation.

Machinery Effects: There will be temporary, local disturbance to the projects where excavation takes place. However, these disturbances are the direct result of restoration activities and are designed to improve conditions. All disturbed ground will be replanted or reseeded with native vegetation.

Noise Effects: the use of trackhoes and other machinery will temporarily increase noise levels within the project. However, given the location of the project in a busy urban area, the noise is not expected to be significantly above ambient levels.

Floodplain Alteration Effects: Excavation and other disturbances along the floodplain are designed to minimize or eliminate existing impacts. The removal of existing spoil piles will restore floodplain function and aesthetics. The removal of large rock will aid in natural fluvial processes. The extension of terraces around manholes will reduce scour and promote better flow across the floodplain. Overall, floodplain modifications will remove stressors and restore natural function to the channel.

3) INSTALLATION OF BRIDGE PIERS.

Four single-pier bridges will be installed at “E”, “G”, “I”, and “K”. The bridges are planned to span the active bankfull stream channel and floodplains. The central pier will be placed within the ACOE jurisdictional area between the active bankfull channel and floodplain. The span between each abutment and the central pier is 15 feet. The 15 feet allows the bridge to completely span the active design channel. The second span will extend maintain the floodplain. The bridges are designed to maintain flow within the natural channel and across the adjacent floodplains (Figure 2). It should be noted that the stream channel is currently constrained at upper and lower ends of the project by passing through existing box culverts and corrugated metal pipe with much less span, clearance, and carrying capacity than the bridges.

Each of the four bridges will require a single pier and footing. Each footing will be approximately 24 inches wide and 30 feet wide. Each footing is approximately 60 square feet in area, the total jurisdictional area to be impacted is 240 square feet. Assuming that the footings will be excavated approximately 3 feet to be below frost and scour depth, the total volume of material would be 3 feet x 240 feet² or 720 feet³ or 26 cubic yards.

Excavation will be accomplished using a trackhoe. Spoil will be removed from the active channel and floodplain areas. All disturbed areas will be replanted and/or reseeded with native vegetation.

Associated Effects

Sedimentation Effects: Due to the ephemeral nature of the stream, any sedimentation impacts are expected to be short-term and local. All disturbed ground will be replanted or reseeded with native vegetation to minimize erosion and sedimentation.

Machinery Effects: There will be temporary, local disturbance to the projects where excavation takes place. However, these disturbances are the direct result of restoration activities and are designed to improve conditions. All disturbed ground will be replanted or reseeded with native vegetation.

Noise Effects: the use of trackhoes and other machinery will temporarily increase noise levels within the project. However, given the location of the project in a busy urban area, the noise is not expected to be significantly above ambient levels.

Channel Alteration Effects: The installation of bridge piers and abutments will maintain the natural bankfull channel width. The width of the existing floodplain will narrow somewhat although the bridge abutments remain outside the ACOE jurisdictional area (Table 2). Although floodprone width is decreased at Bridge #2 & #4, the design width or 30 feet is equal to or greater than many other existing cross-sections. The strong vegetation community and lack of erosion, scour, or other evidence of excess high flow energy in these areas suggests that this width is sufficient to allow flood waters to spread and dissipate.

TABLE 2. BRIDGE SPANS

<u>Bridge Site</u>	<u>Photo Reference</u>	<u>Width of Jurisdictional Area</u>	<u>Floodprone Width</u>
#1	E	27 feet	32 feet
#2	G	27 feet	50 feet
#3	I	29 feet	30 feet
#4	K	32 feet	44 feet

There will be no wetlands filled as a consequence of the project. No perennial waters will be disturbed due to the ephemeral nature of the stream. The jurisdictional area within the project is approximately 125,000 square feet or 2.85 acres. Disturbance within that area due to discharge will cover a maximum area of 4,500 square feet or 0.12 acres. This represents 4.4% of the jurisdictional area within the project. The 90% of the disturbed area (3,860 sq feet) is specifically related to stream restoration activities.

SPECIAL SPECIES IDENTIFICATION:

Sensitive species lists for Coconino County (Table 3) was obtained from the U.S. Fish and Wildlife Service website. A list of species expected to be found in the specific vicinity of the project site (Table 4) was developed through the Arizona Department of Game and Fish Heritage Data Management System. Although a number of endangered species occur in Coconino County, only Mexican spotted owl is likely to be present in the immediate vicinity of the project. The ephemeral flow regime of Switzer Wash eliminates all aquatic species (Apache trout, California Brown pelican, Chiricahua leopard frog, Humpback chub, Kanab ambersnail, Little Colorado spinedace, Razor back sucker, and Gila chub). The project’s urban setting, elevation and habitat needs eliminates several additional species such as Bald eagle (lack of water,

Table 3. Sensitive Species List: US Fish and Wildlife Service

A search of the County Species Lists for Coconino County on the US Fish and Wildlife Service website yielded the following species:

Apache trout	<i>Oncorhynchus apache</i>	Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Black-footed ferret	<i>Mustela nigripes</i>	Endangered
Brady pincushion cactus	<i>Pediocactus bradyi</i>	Endangered
California Brown pelican	<i>Pelecanus occidentalis californicus</i>	Endangered
California condor	<i>Gymnogyps californianus</i>	Endangered
Chiricahua leopard frog	<i>Rana chiricahuensis</i>	Threatened
Humpback chub	<i>Gila cypha</i>	Endangered
Kanab ambersnail	<i>Oxyloma haydeni kanabensis</i>	Endangered
Little Colorado spinedace	<i>Lepidomeda vittata</i>	Threatened
Mexican gray wolf	<i>Canus lupus</i>	Endangered
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened
Navajo sedge	<i>Carex specuicola</i>	Threatened
Razor back sucker	<i>Xyrauchen texanus</i>	Endangered
San Francisco Peaks groundsel	<i>Senecio franciscanus</i>	Threatened
Sentry milk-vetch	<i>Astragalus cremnophylax</i>	Endangered
Siler pincushion cactus	<i>Pediocactus sileri</i>	Threatened
Southwestern willow flycatcher	<i>Empidonax trailii extimus</i>	Endangered
Welsh’s milkweed	<i>Asclepias welshii</i>	Threatened
Gila chub	<i>Gila intermedia</i>	Proposed Endangered
Fickeisen plains cactus	<i>Pediocactus peeblesiansus</i>	Candidate Species
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate Species
<u>Conservation Agreement</u>		
Arizona bugbane	<i>Cimicifuga arizonica</i>	
Paradine plains cactus	<i>Pediocactus paradinei</i>	

Table 4. Sensitive Species List: Heritage Data Management System (Arizona Department of Game and Fish)

A search of the Arizona Department of Game and Fish's (AZGF) Heritage Data Management System indicated that the following species have been documented in the project vicinity. No Critical Habitats are within the project area.

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	STATUS				
		<u>ESA</u>	<u>USFS</u>	<u>BLM</u>	<u>WSCA</u>	<u>NPL</u>
Northern Goshawk	<i>Accipiter gentilis</i>	SC	S		WSC	
Rusby's milk-vetch	<i>Astragalus rusbyi</i>		S			
Bearded gentian	<i>Gentianopsis barbellata</i>		S			
Allen's big-eared bat	<i>Idionycteris phyllotis</i>	SC		S		
Long-eared myotis	<i>Myotis evotis</i>	SC		S		
Occult little brown bat	<i>Myotis lucifugus occultus</i>	SC		S		
Fringed myotis	<i>Myotis thysanodes</i>	SC		S		
Long-legged myotis	<i>Myotis volans</i>	SC		S		
Rocky Mt. bristlecone	<i>Pinus aristata</i>					SR
Northern leopard frog	<i>Rana pipiens</i>		S		WSC	
Blumer's dock	<i>Rumex orthoneurus</i>	SC	S			HS
Mexican spotted owl	<i>Strix occidentalis lucida</i>	LT	S		WSC	

ESA: Endangered Species Act

- LE: Listed Endangered
- LT: Listed Threatened
- XN: Experimental Noessential population
- PE: Proposed Endangered
- PT: Proposed Threatened
- C: Candidate species
- SC: Species of concern

USFS: US Forest Service

- S: Sensitive

BLM: Bureau of Land Management

- S Sensitive
- P Populations

WSCA: Wildlife of Special concern in Arizona; AZ Game and Fish Dept.

- WSC: Wildlife of Concern

NPL: Arizona Native Plant Law; AZ Dept. of Agriculture

- HS Highly Safeguarded
- SR Salvage Restricted
- ER Export Restricted
- SA Salvage Assessed
- HR Harvest Restricted

urbanized area), Black-footed ferret (requires large open grasslands), Brady pincushion cactus (lower elevation), Navajo sedge (seep springs 5700 - 6000 feet elevation), San Francisco Peaks groundsel (+ 10,900 feet elevation), Sentry milk-vetch (Pinyon-juniper-cliffrose habitat), Siler pincushion cactus (2,800 - 5,400 feet elevation, desert scrub), Southwestern willow flycatcher (dense cottonwood/willow/tamarisk streamside communities), and Welsh's milkweed (desertscrub sand dunes). Information on specific species was collected on the U.S. Fish and Wildlife Service website.

These conclusions are consistent with the database listing from the AZGF Heritage Data Management System (Table 4). That database suggests that Mexican spotted owl may be found near the project. However, a conversation with local biologist (T. Parker, USFS) suggests that due to a lack of small mammal habitat, lack of water, and being located in an open setting within a busy urban area, the project does not contain suitable habitat for the spotted owl. The nearest known owl Potential Action Centers (PACs) are located at Mt. Elden and Dry Lake, both several miles away and are located in non-urban, remote settings associated with water sources.

DETERMINATION OF EFFECTS:

Based on the location of the project within an urban setting and with past human disturbances, it is our conclusion that the Switzer Wash project site does not contain suitable habitat for any Federally listed species and will have “no effect” on any listed species or their habitats.

REFERENCES

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Parker, T. R., 2002. Personal communication. Wildlife Biologist, U.S.D.A. Coconino National Forest, Flagstaff, AZ.

U.S. Fish and Wildlife Service. Spring 1998. Endangered and Threatened Species of Arizona. 2321 W. Royal Palm Rd., Suite 103, Phoenix, AZ 85021.

Appendix A

Project Activities

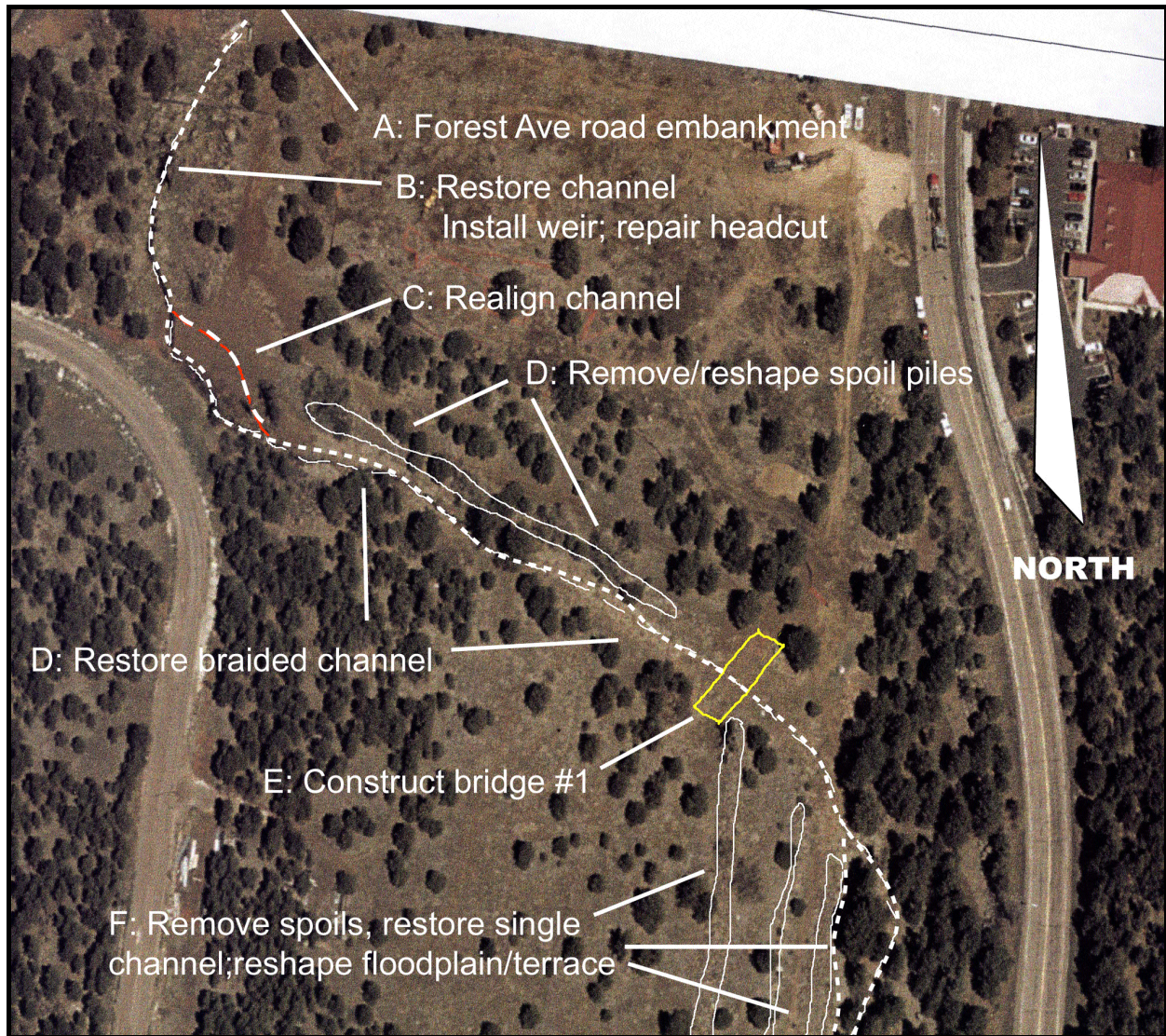


Figure A1. Aerial Photo: North portion of Project Area

- A. Existing box culvert and road embankment at Forest Avenue. Terrace slope to reduce sediment, revegetate with native species. Outside jurisdictional area.
- B. Restore channel dimension to braided channel section resulting from high upstream sediment supply. Install low rock weir and restore channel dimension to headcut/gully (Figure 5).
- C. Realign channel away from high road embankment to reduce sediment impacts (Figure 6). Within jurisdiction.
- D. Remove and/or reshape spoil piles to restore floodplain shape and dimension (Figure 7). Partially within jurisdictional area. Excavate braided channel as needed to restore natural dimension (Figure 7). Recontour and lower channel approximately 1.5 feet at between XS1 and Bridge site #1 (E in Figure 1)) to match channel slopes above and below. There is an existing sewer line that crosses the channel here (see Jurisdictional area report and plan views) and it appears may be responsible for the higher channel thalweg elevation. This task will not result in any additional fill within the jurisdictional area.
- E. Bridge site #1. One or two concrete piers will be constructed as far from bankfull channel as possible. See Figure 9.

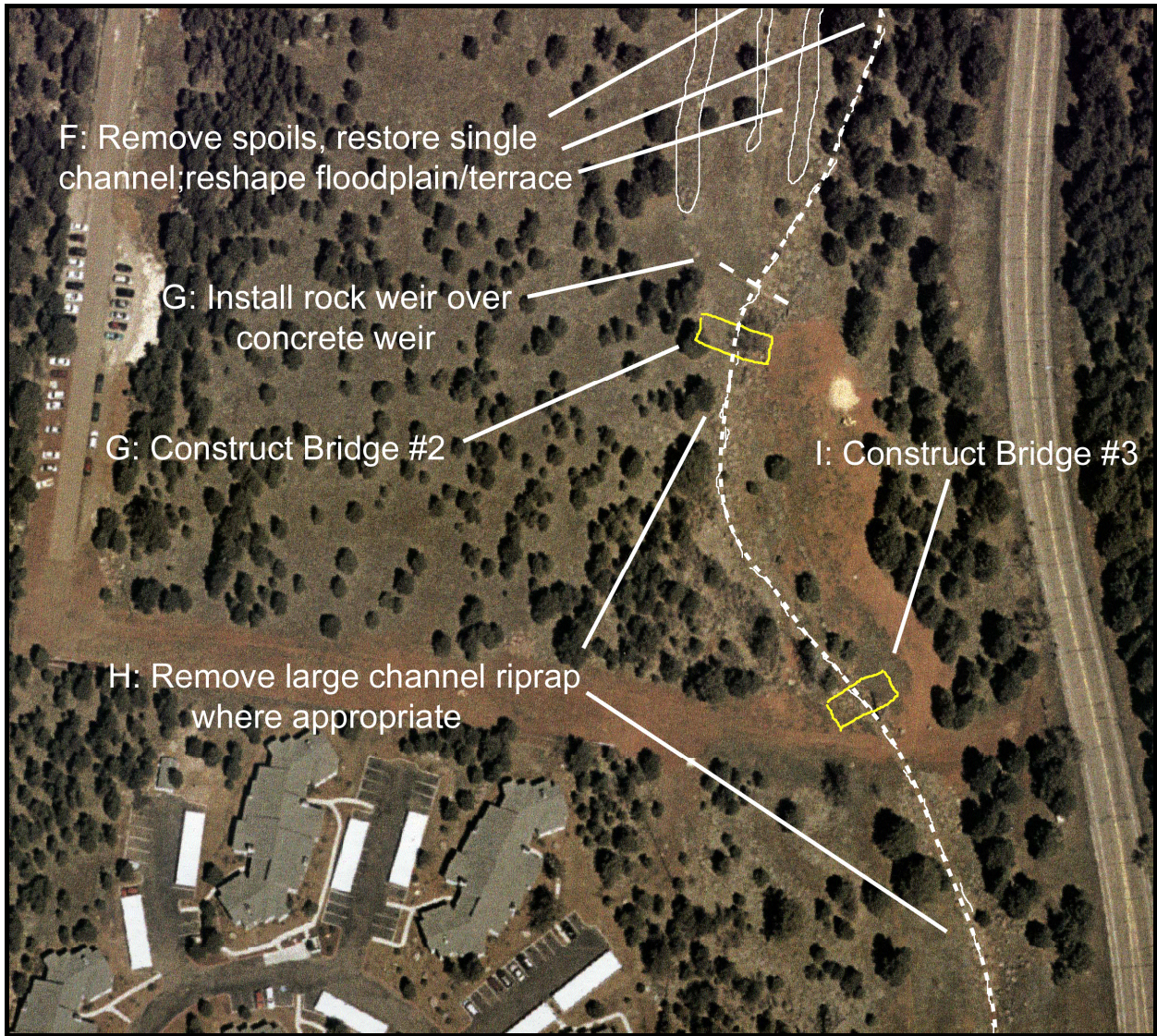


Figure A2. Aerial Photo: North-central portion of Project Area

F. Remove/reshape spoils. Outside jurisdictional area.

G. Bridge site #2. One or two concrete piers will be constructed as far from bankfull channel as possible. See Figure 10.

H. Remove or reshape large rock riprap in channel as necessary, leave smaller material.

I. Bridge site #3. One or two concrete piers will be constructed as far from bankfull channel as possible. See Figure 11.

An existing concrete weir protects a water line that crosses at G just below bridge site #2 (Figure 2). A flat concrete sill has been constructed on top of the water line to protect it from scour. The wide, flat sill widens the channel, disturbs sediment flow, and creates scour upstream. We propose to install a cross-vane rock weir at this point to center the flow and improve sediment transport. Scour holes above the weir will be brought up to channel grade. The structure will rise only to floodplain elevation and have a “V” shape with the point aimed upstream. The design is similar to the weir planned for area A of the project. The weir will be constructed of approximately 5 cubic yards of local native rock.



Figure A3. Aerial Photo: South-central portion of Project Area

- J. Remove or reshape large rock riprap in channel as necessary, leave smaller material. Excavation only.
- K. Bridge site #4. One or two concrete piers will be constructed as far from bankfull channel as possible. Potentially within jurisdictional area. See Figure 12.
- L. Repair terrace where erosion has exposed a large concrete manhole. Revegetate terrace banks. Outside jurisdictional area.
- M. Remove concrete rubble and other trash from terrace edge. Outside jurisdictional area.
- N. Realign channel slightly to west to allow terrace to be extended to enclose tall exposed concrete manhole (see Figure 8). Within jurisdictional area.



Figure A4. Aerial Photo: Southern portion of Project Area

- O. Remove concrete rubble and other trash from terrace edge. Outside jurisdictional area.
- P. Repair terrace where erosion has exposed a large concrete manhole. Revegetate terrace banks. Outside jurisdictional area.
- Q. All along the channel though areas M, N, O, P, & Q the existing channel runs through relatively thick stands of ponderosa pine. In these areas the channel is often braided and clogged with debris. This almost certainly is not the channels original alignment. It appears that previous filling along Turquoise Drive to the east has forced the channel into the trees. We propose to realign the channel to remain clear of trees and in a more open area. This will entail creating a shallow channel for about 1,000 feet in the new alignment. See Figure 2 for a typical design cross-section. The existing channel will be filled to floodplain elevation using material from the new channel. Approximately 500 cubic yards of material will be excavated. We estimate that approximately 300 cubic yards will need to be discharged to fill the existing channel(s). This part of the project is included in the urban "Open Space" deeded to the City of Flagstaff.



Figure A5. Small channel headcut at “B” on site map.



Figure A6. Steep road embankment at “C” adds excessive sediment to stream channel. Proposed action is to realign 150 ft of channel away from embankment. Area “C” on site map.



Figure A7. Large rock spoil piles along the floodplain at “D” on site map. Spoil material will be removed and/or smoothed to restore the floodplain.



Figure A8. Existing manhole lies exposed in floodplain. Left terrace will be extended to include manhole to improve aesthetics and reduce floodplain scour. Area “N” on site map.



Figure A9. Bridge site #1 at Area “E”. Looking downstream.



Figure A10. Bridge site #2 at “G”. Looking downstream.



Figure A11. Bridge site #3 at Area “I”. Photo taken looking upstream.



Figure A12. Bridge site #4 at Area “K”. Photo taken looking downstream.