BIOLOGICAL EVALUATION OF THE IRON KING MINE - HUMBOLDT SMELTER SUPERFUND SITE

Prepared for

EA Engineering, Science, and Technology, Inc.

Prepared by

EnviroSystems Management, Inc.

Environmental Planning • Regulatory Compliance

January 7, 2009

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1.0 INTRODUCTION

EA Engineering, Science and Technology, Inc. contracted with EnviroSystems Management, Inc. to conduct a Biological Evaluation and Biological Regulations Review under the authority of the U.S. Environmental Protection Agency (EPA) for a Remedial Investigation/Feasibility Study at the Iron King Mine and Humboldt Smelter Superfund Site located near Dewey-Humboldt in Yavapai County, Arizona. The EPA Identification Number for the site is AZ0000309013.

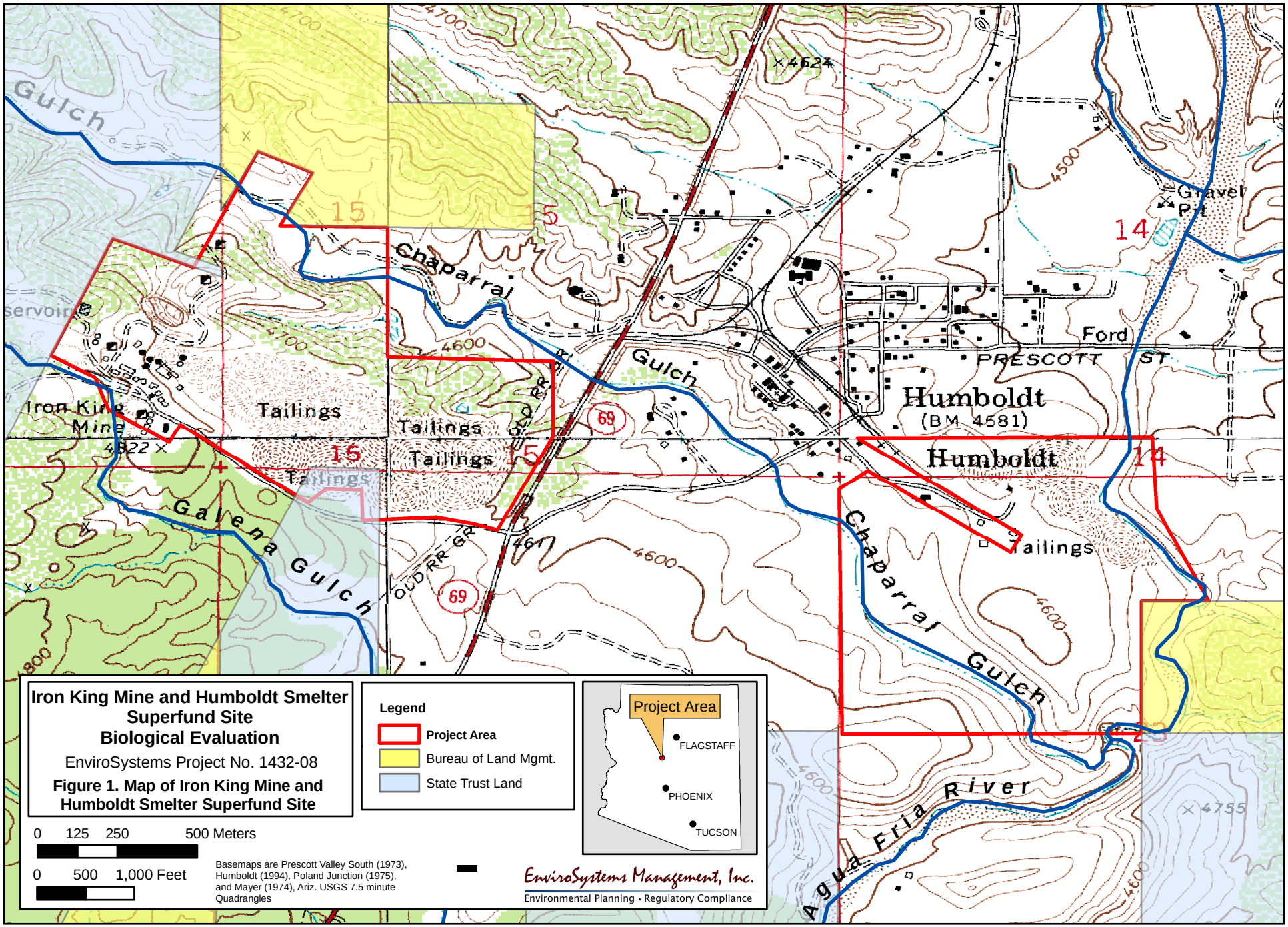
2.0 SITE DESCRIPTION AND HISTORY

The project area includes two sites of potential contamination: The Iron King Mine site and the Humboldt Smelter site. These two sites are located in Sections 14-16 and 21-23, T13N, R10E, Gila and Salt River Baseline and Meridian. The project area is depicted on the Prescott Valley South, Ariz. (1973), Humboldt, Ariz. (1994), Poland Junction, Ariz. (1975) and Mayer, Ariz. (1974), USGS 7.5 minute quadrangles (Figure 1).

The Iron King Mine is a former underground gold, silver, copper, lead, zinc, and cadmium mine located on the northeast slopes of the Bradshaw Mountains, about 0.5 miles west of the town of Humboldt (Sawyer et al. 1992). The initial discovery occurred in 1880 and the mine was active from the late 1900s until 1974. The mine area encompasses approximately 153 acres, much of which is covered by mine tailings, waste rock, and recent additions of mulched wood waste. Five retention ponds are found on the site, all of which contained water at the time of this assessment.

Encompassing approximately 182 acres, the Humboldt Smelter site is 1 mile to the southeast of the Iron King Mine site and was active from the late 1800s until the late 1960s. Some areas of the site surface are covered with yellow-orange mine tailings, slag, and smelter ash. The town of Humboldt is located immediately adjacent to the Humboldt Smelter Site to the north and northwest. The original smelter burned down in 1904 and a smelter that processed 1,000-tons of ore per day was built in 1905. Smelter operations occurred intermittently at this site until 1937 (EPA 2008).

Three primary waterways are found within the project site and are the Agua Fria River, Chaparral Gulch, and Galena Gulch. The Agua Fria River is a perennial drainage located to the east of the Humboldt Smelter site and flows to the south within 500 feet of the historic smelting facility. Chaparral Gulch is an intermittent drainage that flows to the southeast along the northern portion of the Iron King Mine site, under Highway 69, and across the southwestern portion of the Humboldt Smelter site. A tailings dam is located within Chaparral Gulch near the southern boundary of the Humboldt Smelter site and approximately 0.25 miles upstream of the confluence of Chaparral Gulch with the Agua Fria River. Galena Gulch is an ephemeral drainage that flows to the southeast along the westernmost boundary of the Iron King Mine site for a distance of approximately 500 feet.


Iron King Mine and Humboldt Smelter Superfund Site
Biological Evaluation
EnviroSystems Project No. 1432-08
Figure 1. Map of Iron King Mine and Humboldt Smelter Superfund Site
Legend
Project Area
Bureau of Land Mgmt.
State Trust Land
Project Area
FLAGSTAFF
PHOENIX
TUCSON
0 125 250 500 Meters
0 500 1,000 Feet
Basemaps are Prescott Valley South (1973), Humboldt (1994), Poland Junction (1975), and Mayer (1974), Ariz. USGS 7.5 minute Quadrangles
EnviroSystems Management, Inc.
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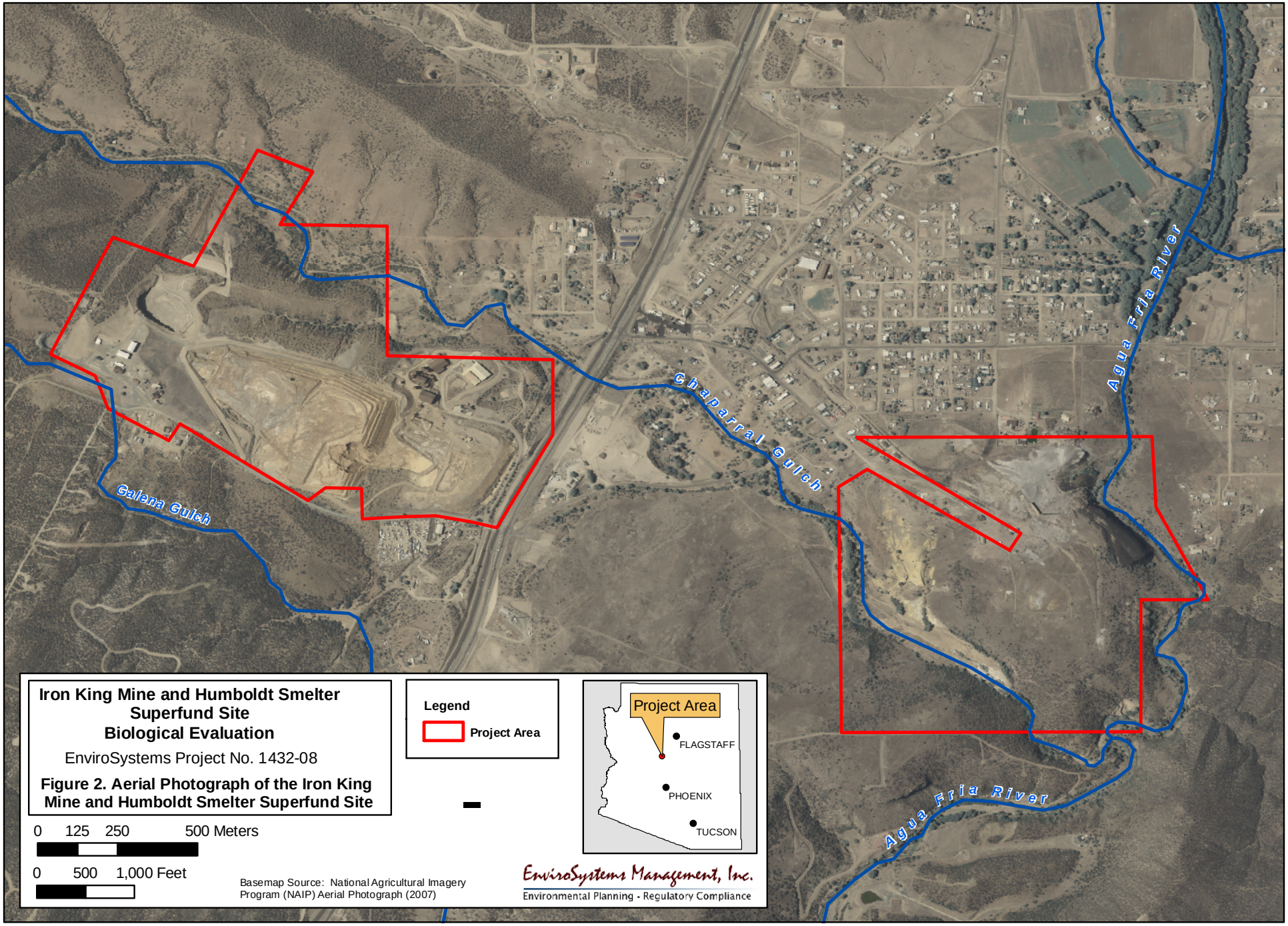
Humboldt
(BM 4581)
Humboldt
Ford
PRESCOTT ST
Gravel Pit
Chaparral Gulch
Galena Gulch
Agua Fria River
Iron King Mine
Tailings
Tailings
Tailings
Tailings
Tailings
Gulch
4624
4500
4600
4700
4755
69
15
14


Galena Gulch
Chaparral Gulch
Agua Fria River
Agua Fria River
Iron King Mine and Humboldt Smelter Superfund Site
Biological Evaluation
EnviroSystems Project No. 1432-08
Figure 2. Aerial Photograph of the Iron King Mine and Humboldt Smelter Superfund Site
Legend
Project Area
Project Area
FLAGSTAFF
PHOENIX
TUCSON
0 125 250 500 Meters
0 500 1,000 Feet
Basemap Source: National Agricultural Imagery Program (NAIP) Aerial Photograph (2007)
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3.0 SURVEY METHOD

Prior to conducting the field survey, EnviroSystems Management, Inc. completed a review of the project site in relation to Special Status Species (SSS) and other wildlife of Arizona through the Arizona Game and Fish Department (AGFD) Heritage Data Management System (HDMS). SSS include all U.S. Fish and Wildlife Service (USFWS) federally listed, and AGFD recognized species of concern. The HDMS contains information about species occurrences that have actually been reported to AGFD.

In addition to reviewing the AGFD HDMS in relation to the project site, a review of the USFWS Southwest Region Ecological Services Endangered Species List for Yavapai County was conducted. This searchable database includes species currently listed as threatened or endangered under the Endangered Species Act of 1973 as well as species considered candidates for listing in Yavapai County.

Soils data for the project site were reviewed using the Web Soil Survey (WSS) online tool which provides soil data and information produced by the National Cooperative Soil Survey. The application is managed by the USDA Natural Resources Conservation Service (NRCS). Soils mapping unit information was used to determine potential suitable habitat for special-status plant species.

A pedestrian survey of the project site was conducted on August 26, 2008 using a gradient traverse approach and by walking drainages. The rationale for gradient traverse is that sampling transects that are oriented along landscape gradients allow for the detection of the maximum number of species and habitat types in a given area in a time-efficient and cost-effective manner as compared to random, systematic, and habitat-specific methods (Gillison and Brewer 1985). Characteristics of terrestrial habitats including dominant plant communities, wildlife habitat types and uses, and observed wildlife species were recorded. Aquatic habitat observations included general stream morphological and hydrological characteristics, average depth and channel dimensions, estimation of flow rates, presence/absence of aquatic vegetation, presence/absence of aquatic organisms, and overall habitat quality and type.

4.0 ENVIRONMENTAL SETTING

The project site is located in the Arizona chaparral sub-type of the Interior Chaparral Biotic Community which is largely composed of grasslands, chaparral, and pinyon/juniper woodlands (Brown 1994). Mining activities and industrialization on the project sites have resulted in severely degraded, yet generally accessible habitat for wildlife species potentially present in the area. Terrestrial habitats immediately surrounding the project site include areas of rural development, natural surface roads, and interior chaparral with riparian habitats along drainages. Riparian vegetation is found primarily along the Agua Fria River and Chaparral Gulch. Galena Gulch did not exhibit riparian characteristics in areas near the project site.

The dominant native substrate throughout the project area consists of precambrian granite, gneiss, and schist (Chronic 1983). Soils within the project area primarily consist of well-drained, shallow soils and rock outcrop on semiarid, mid-elevation hills and mountains. These soils formed in residuum weathered from granite, gneiss, rhyolite, andesite, tuffs, limestone,

sandstone, and basalt (Hendricks 1985). The dominant soils mapping unit on the Iron King Mine site is the Balon gravelly sandy loam which are very deep, well-drained soils that formed in mixed fan alluvium dominantly from schist, granite, basalt and related rocks. Slopes are 2 to 25 percent. Balon soils are classified as fine-loamy, mixed, superactive, mesic Ustic Haplargids.

The dominant soils mapping unit on the Humboldt Smelter site is the Springerville-Cabezon complex. Springerville soils consist of deep, well-drained soils that formed in alluvium from tuff, volcanic breccia and basalt. These soils are found on plateaus and mesas and have slopes of 0 to 10 percent. Springerville soils are classified as fine, smectitic, mesic Aridic Haplusterts. Cabezon soils are shallow, moderately slowly to slowly permeable soils that formed in eolian material over residuum derived from basalt. Cabezon soils are found on lava plateaus. Cabezon soils are classified clayey, smectitic, mesic Aridic Lithic Argiustolls.

Soils within the project site have been overlaid at many locations with mine tailings, smelter ash, or slag material. Breaches in the tailings piles at the Iron King Mine site and the Humboldt Smelter site have resulted in migration of mine tailings onto lower landscape positions to the east. Tailings have also been introduced into Chaparral Gulch from stormwater runoff. There was no evidence of stormwater run-on/runoff controls observed during the biological survey.

Upland vegetation is characterized as an Interior Chaparral biotic community and more specifically the "Arizona" chaparral sub-type. Chaparral shrublands in Arizona occur on generally rough to rolling, discontinuous, mountainous, terrain south of the Mogollon Rim. The topography is characterized as steep to rolling uplands dissected by steep-walled canyons (Brown 1994). Chaparral vegetative communities in Arizona are found in a discontinuous band across the central part of the state from northwest to southeast with elevations ranging from 3,000 to over 6,000 ft. Shiflet (1994) describes the distribution as "extending from the Hualapai and Aquarius Mountains on the west, southeast along the foothills below the Mogollon Rim through the Bradshaw, Mazatzal, Sierra Ancha, Apache, Pinal, and Santa Teresa Mountains, plus small patches on the Galiuro, Catalina, and Rincon Mountains."

5.0 VEGETATIVE COMMUNITIES AT THE IRON KING MINE SITE

5.1 Upland Vegetation

On the Iron King Mine Site, shrub live oak (*Quercus turbinella*) is the dominant species throughout most of the undisturbed upland areas (Table 1, Figure 3). Tree species observed within the upland chaparral biotic community are sparse and scattered and include the oneseed juniper (*Juniperus monosperma*), alligator juniper (*Juniperus deppeana*), and Arizona walnut (*Juglans major*). Many of the walnuts exhibited stress in the form of decadent crowns with lower limbs continuing to produce leaves and fruit. It is likely that prolonged drought stress and pathogenic fungi have contributed to the decline in the vigor of Arizona walnuts on the site although phytotoxicity caused by metals or other chemical constituents leached from mine tailings may also be a factor leading to their decline. Tree species observed on upland areas generally exhibited shrub form with few exceeding 15 ft. in height. Shrub and half-shrub species and annual and perennial grasses and forbs are also present, particularly where the overstory canopy is open or only moderately dense. Associated shrub and half-shrub species observed

during the survey include broom snakeweed, pointleaf manzanita (*Arctostaphylos pungens*), rabbitbrush (*Ericameria nauseosa*), catclaw acacia (*Acacia greggii*), desert ceanothus (*Ceanothus greggii*), cliffrose (*Cowania mexicana*), hollyleaf buckthorn (*Rhamnus crocea*), and white sagebrush (*Artemisia ludoviciana*). These species were generally scattered in interscrub areas where shrub live oak was prevalent. Due to the relatively high percentage of crown cover (50% to 60%) in many areas, grasses and forbs were not abundant except in interscrub openings and disturbed areas that are beginning to recover. Grasses observed during the survey included sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), red brome (*Bromus rubens*), black grama (*Bouteloua eriopoda*), and plains lovegrass (*Eragrostis intermedia*). Forbs were more prevalent than grasses and included common yarrow (*Achillea millefolium*), hairy fleabane (*Conyza bonariensis*), Palmer's penstemon (*Penstemon palmeri*), purple nightshade (*Solanum xantii*), Davis Mountain mock vervain (*Glandularia bipinnatifida*), and a few, scattered sacred thorn-apple (*Datura wrightii*). Approximately 25 percent of the land surface had no vegetative cover. These areas are best characterized as gravelly bare ground.

Table 1. Upland Vegetation Communities occurring on the Iron King Mine Site

Sub-type	**Major Species**
Arazona Chaparral sub-type of the Interior Chaparral biotic community	Grasses: sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), red brome (*Bromus rubens*), black grama (*Bouteloua eriopoda*), and plains lovegrass (*Eragrostis intermedia*). Shrubs: shrub live oak (*Quercus turbinella*), broom snakeweed (*Gutierrezia sarothrae*), pointleaf manzanita (*Arctostaphylos pungens*), rabbitbush (*Ericameria nauseosa*), catclaw acacia (*Acacia greggii*), desert ceanothus (*Ceanothus greggii*), cliffrose (*Cowania mexicana*), hollyleaf buckthorn (*Rhamnus crocea*), and white sagebrush (*Artemisia ludoviciana*). Forbs: common yarrow (*Achillea millefolium*), hairy fleabane (*Conyza bonariensis*), Palmer's penstemon (*Penstemon palmeri*), purple nightshade (*Solanum xantii*), Davis Mountain mock vervain (*Glandularia bipinnatifida*), and sacred thorn-apple (*Datura wrightii*). Trees: oneseed juniper (*Juniperus monosperma)*, alligator juniper (*Juniperus deppeana*), Arizona walnut (*Juglans major*).

5.2 Riparian Corridors

The riparian corridor surrounding the reach of Chaparral Gulch that extends from the Iron King Mine site to Highway 69 is dominated by invasive tree species at many locations along the corridor (Table 2). These species include tree of heaven (*Ailanthus altissima)*, Siberian elm (*Ulmus pumila*), and tamarisk (*Tamarix* spp.). Native riparian tree species observed within this stream reach include Arizona walnut (*Juglans major*), cottonwood (*Populus fremontii*), velvet mesquite (*Prosopis velutina*), and willow (*Salix* spp.). Common forbs observed within the riparian corridor include: flatspine bur ragweed (*Ambrosia acanthicarpa*), tall tumblemustard (*Sisymbrium altissimum*), and horehound (*Marrubium vulgare*), an invasive weed. Areas within Chaparral Gulch that are dominated by invasive species are primarily west of Highway 69 while native plant communities are dominant in areas east of the highway.

No riparian vegetative cover was observed within Galena Gulch where it traversed the westernmost portion of the Iron King Mine site. The northern stream bank has been reshaped to rise approximately one meter for every three meters of distance. Additionally, mulched wood waste has been applied to the northern side of the reshaped stream bank and on adjacent upland areas.

Table 2. Vegetation in the Riparian Corridor of Chaparral Gulch on the Iron King Mine Site

Type	Major Species
Interior Riparian Deciduous Forest	Forbs: flatspine bur ragweed (*Ambrosia acanthicarpa*), horehound (*Marrubium vulgare*), tall tumblemustard (*Sisymbrium altissimum*), and common ragweed (*Ambrosia artemisiifolia*) Trees: tree of heaven (*Ailanthus altissima*), Siberian elm (*Ulmus pumila*), tamarisk (*Tamarix* spp.), Arizona walnut (*Juglans major*), cottonwood (*Populus fremontii*), velvet mesquite (*Prosopis velutina*), and willow (*Salix* spp.)

5.3 Areas with No Vegetative Cover

Large areas of the Iron King Mine site are covered with mine tailings and waste rock. These areas generally lack vegetative cover. Sparse shrubs and forbs were observed at various locations in these areas and they generally exhibited poor growth form indicative of stress related to phytotoxic conditions. While these areas are indicative of severely degraded wildlife habitats, it is likely that they are utilized as occasional migration corridors between undisturbed areas and water bodies within and adjacent to the Iron King Mine site.

6.0 STREAM MORPHOLOGIC AND HYDROLOGIC CHARACTERISTICS AT THE IRON KING MINE SITE

6.1 Chaparral Gulch

Chaparral Gulch is an intermittent drainage that flows along the northern boundary of the Iron King Mine site, through the southern areas of the town of Humboldt and through the southwest portion of the Humboldt Smelter facility. The upper reach of Chaparral Gulch adjacent to the Iron King Mine site averages 21 feet in width (bankfull discharge) from the location where the drainage enters the northwest corner of the Iron King Mine site to the location where it exits the mine property. The average depth of the downcut is approximately four feet. The channel is moderately entrenched and exhibits low sinuosity. The channel sinuosity ratio for the reach extending from the location where the drainage enters the Iron King Mine site to the location where it intersects Highway 69 is approximately 1.17 (Rosgen 1996). Channel substrates within this reach of the drainage are a combination of alluvial and colluvial material ranging from fine particle sizes (silts and clays) to rounded gravels and cobbles, and angular rock fragments. Most of the larger materials are embedded in the finer sediments. Much of the fine sediment in Chaparral Gulch near the eastern portion of this reach originated from mine tailings that have discharged with stormwater runoff from the Iron King Mine. Chapparal Gulch was dry when the field survey was conducted, although channel substrates were moist. It is likely that there was some subsurface flow through saturated channel alluvium. Chaparral Gulch does not provide

suitable habitat for aquatic organisms throughout most the reach within and adjacent to the Iron King Mine site. However, it is possible, that pools remain within the channel for sufficient duration to support breeding habitat for some frogs and other semi-aquatic organisms.

6.2 Galena Gulch

Galena Gulch is best characterized as a dry wash where it enters and exits the Iron King Mine site near the westernmost corner of the subject property. The stream bank has been disturbed/reshaped as a result of construction activities and deposition of waste rock adjacent to the drainage. The average width of the channel is approximately 10 feet (bankfull discharge), and the bankfull depth is approximately 2 feet. The natural hydrology of the drainage has been altered by the reshaping (outsloping) of the bank and deposition of mulch and debris into the drainageway. Galena Gulch flows under Iron King road through a 48-inch diameter corrugated metal culvert. The culvert has been improperly installed in a "shotgun" manner and the outfall area has been scoured to form a pool. Dominant vegetation within the drainage includes common ragweed (*Ambrosia artemisiifolia*), and broom snakeweed. Channel substrates include alluvial and colluvial fine sediments (silts and clays) and angular rock fragments. The drainage was dry when the field survey was conducted and substrates were dry. It is unlikely that there was subsurface flow through saturated alluvium. This segment of Galena Gulch does not provide suitable habitat for aquatic organisms.

6.3 Ephemeral Drainages

Six ephemeral drainages were observed within the Iron King Mine Site during the site investigation. All of these drainages had confluences with Chaparral Gulch. Two of these ephemeral drainages had confluences with Chaparral Gulch on the north side of the channel. These washes did not appear to have been impacted by mining operations and therefore do not negatively impact Chaparral Gulch beyond introduction of natural sediments through accelerated runoff. Two other ephemeral drainages flow to the northeast from a location northwest of a former drum storage area. These two drainages are introducing sediments to Chaparral Gulch above normal background levels. These sediments originate from disturbed upland areas. The two remaining ephemeral drainages originate from mine-impacted areas and appear to be introducing tailings into Chaparral Gulch. One of the drainages had an erosion control structure (staked hay bales) installed to mitigate erosion and sedimentation. All ephemeral drainages were dry at the time of the biological field survey and did not exhibit any areas of relatively permanent water. The two drainages that originate from the mine tailings are likely to be negatively impacting the downstream aquatic environment of Chaparral Gulch during runoff events through introduction of mine tailings and acidic runoff to the stream channel.

7.0 WILDLIFE SPECIES OBSERVED AT THE IRON KING MINE SITE

Wildlife species observed within the Iron King Mine site include a cottontail (*Sylvilagus floridanus*), which was observed approximately 300 feet west of the Highway 69 overpass of Chaparral Gulch; a covey of approximately six Gambel's quail (*Callipepla gambelii*) near the northeastern property corner that intersects Chaparral Gulch; a desert grassland whiptail (*Aspidoscelis uniparens*) in Chaparral Gulch where the Gulch exits the Iron King Mine property; an unidentified raptor near the westernmost boundary where Galena Gulch crosses under Iron

King Road via a 48-inch-diameter culvert; and a common raven (*Corvus corax*) near the Iron King Mine industrial/mineral processing area.

8.0 OTHER WILDLIFE SPECIES LIKELY TO BE PRESENT AT THE IRON KING MINE SITE BASED ON OBSERVED SIGNS

Based on interviews with mine personnel, previous wildlife sightings within the Iron King Mine site have included white-tailed deer (*Odocoileus virginianus*), which were reported to have been observed utilizing tailings ponds; javelina (*Pecari tajacu*), which have been observed in Chaparral Gulch; and a possible great horned owl (*Bubo virginianus*), which has previously occupied a decommissioned conveyor near the mine shops, but no longer does so.

Personnel from the EPA have reportedly observed a road runner (*Geococcyx californianus*) on the slag at the Humboldt Smelter Site; hummingbirds believed to be either Costa's hummingbird (*Calypte costae*) or Calliope hummingbird (*Stellula calliope*) that were observed in Galena Gulch and Chaparral Gulch; and a toad, possibly an Arizona toad (*Bufo microscaphus*) observed on the bank of Chaparral Gulch below the tailings dam. These observations were made on August 28, 2008.

During the survey, deer (*Odocoileus* sp.) and collared peccary (*Pecari tajacu*) tracks were observed within Chaparral Gulch and canine tracks were observed at several locations on the site including near the decommissioned conveyors and along the unimproved road adjacent to the impoundment known as Lake Ironite. Small rodent burrows were observed along the property line adjacent to Iron King Road. Indications of livestock grazing including hoof prints and cattle feces were observed at several locations on the northeastern portion of the Iron King Mine site.

9.0 VEGETATIVE COMMUNITIES AT THE HUMBOLDT SMELTER SITE

9.1 Upland Vegetation

Upland vegetation on the Humboldt Smelter Site is also characterized as the “Arizona” chaparral sub-type biotic community. However, relatively flat upland plant communities to the south of the smelting facility and lying between the Agua Fria River and Chaparral Gulch exhibit characteristics of semi-desert grasslands (Table 3, Figure 4).

On the Humboldt Smelter Site, hairy fleabane, purple nightshade, and Davis Mountain mock vervain are the dominant forb species throughout most of the relatively flat, upland areas with bull thistle (*Cirsium vulgare*), and sunflower (*Helianthus annuus*) as occasional associates. Grasses include sideoats grama, hairy grama, red brome, and fluff grass (*Tridens pulchellus*). Tree and shrub species of the upland chaparral biotic community are primarily found on side slopes and transition zones and are dominated by shrub live oak, catclaw acacia, oneseed juniper, and alligator juniper. Tree species observed on upland areas generally exhibited shrub form with few exceeding 8 ft. in height. Other associated shrub and half-shrub species include broom snakeweed, rabbitbush, prickly pear (*Opuntia* spp.), cholla (*Opuntia* spp.), banana yucca (*Yucca bacata*), goldenflower century plant (*Agave chrysantha*), and Canotia (*Canotia holocantha*).

Table 3. Upland vegetation communities occurring on the Humboldt Smelter Site

Sub-type	Major Species
Arazona Chaparral sub-type of the Interior Chaparral biotic community	Grasses: sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), red brome (*Bromus rubens*), and fluff-grass (*Tridens pulchellus*). Shrubs:, catclaw acacia (*Acacia greggii*), broom snakeweed (*Gutierrezia sarothrae*), rubber rabbitbush (*Ericameria nauseosa*), prickly pear (*Opuntia* spp.), cholla (*Opuntia* spp.), banana yucca (*Yucca bacata*), goldenflower century plant (*Agave chrysantha*), and Canotia (*canotia holocantha*). Forbs: hairy fleabane (*Conyza bonariensis*), purple nightshade (*Solanum xantii*), Davis Mountain mock vervain (*Glandularia bipinnatifida*), bull thistle (*Cirsium vulgare*), sunflower (*Helianthus annuus*). Trees: shrub live oak (*Quercus turbinella*), oneseed juniper (*Juniperus monosperma*), and alligator juniper (*Juniperus deppeana*).

9.2 Riparian Vegetation

The reach of Chaparral Gulch that extends from the low water crossing at 3rd Street to the tailings dam in the Humboldt Smelter site is dominated by mature tree species including Fremont cottonwood, velvet ash (*Fraxinus velutina*), Siberian elm, Arizona walnut, velvet mesquite, with occasional tamarisk in the understory (Table 4). Common forbs include curly dock (*Rumex crispus*), horehound, and tall tumblemustard. Approximately 1,500 feet of Chaparral Gulch extending to the northwest from the concrete tailings dam appeared to be severely impacted by discharge of eroded tailings from the Humboldt Smelter tailings pile. Sparse vegetative cover was observed from the base of the tailings pile on the Humboldt Smelter site to the concrete tailings dam. Below the tailings dam the overstory is composed primarily of Fremont cottonwood and willow with a variety of rushes (*Juncus* sp.), and sedges (*Carex* sp.) along the banks and on sediment bars.

9.3 Areas with No Vegetative Cover

Large areas of the Humboldt Smelter site exhibited conditions generally unsuitable for supporting vegetative cover. These areas include much of the tailings pile adjacent to Chaparral Gulch, ash surrounding the smelting facility, and slag adjacent to the Agua Fria River. It is likely that wildlife utilize these areas as habitat corridors. Slag piles that overhang the Agua Fria River may also serve as escape cover and roosting or nesting areas for birds.

Table 4. Vegetation in Riparian Corridor of Chaparral Gulch on the Humboldt Smelter Site.

Sub-type	Major Species
Interior Riparian Deciduous Forest	Forbs: curly dock (*Rumex crispus*), horehound (*Marrubium vulgare*), and tall tumblemustard (*Sisymbrium altissimum*) Trees: cottonwood (*Populus fremontii*), velvet ash (*Fraxinus velutina*), Siberian elm (*Ulmus pumila*), Arizona walnut (*Juglans major*), velvet mesquite (*Prosopis velutina*), tamarisk (*Tamarix* spp.), and willow (*Salix* spp.)

Riparian vegetation found along the Agua Fria River east of the Humboldt Smelter site is dominated by cottonwood, ash and willow in the overstory. Tamarisk is common in the midstory. Dominant understory vegetation includes common sowthistle (*Sonchus oleraceus*), cocklebur (*Xanthium* spp.), curly dock, bulrush (*Scirpus* sp.), sedges, red brome, and watercress (*Nasturtium officinale*) (Table 5).

Table 5. Vegetation in the Riparian Corridor of the Agua Fria River on the Humboldt Smelter Site

Sub-type	Major Species
Interior Riparian Deciduous Forest	Forbs: curly dock (*Rumex crispus*), horehound (*Marrubium vulgare*), and tall tumblemustard (*Sisymbrium altissimum*) Trees: cottonwood (*Populus fremontii*), velvet ash (*Fraxinus velutina*), Siberian elm (*Ulmus pumila*), Arizona walnut (*Juglans major*), velvet mesquite (*Prosopis velutina*), tamarisk (*Tamarix* spp.), and willow (*Salix* spp.)

10.0 STREAM MORPHOLOGIC AND HYDROLOGIC CHARACTERISTICS AT THE HUMBOLDT SMELTER SITE

10.1 Agua Fria River

The Agua Fria River flows along the eastern boundary of the Humboldt Smelter site. This reach of the River is supported by perennial flow. The river was flowing at an estimated rate of approximately 5 CFS when the field survey was conducted. The river is confined between steep slopes throughout this reach. Minimal channel downcutting was observed within the floodplain between the steep hills. The average channel width (bankfull discharge) is 11 feet and channel depth is 1.5 feet. The sinuosity ratio is approximately 1.1 which is nearly equal to valley length for this reach of the River. The width to depth ratio is approximately 7.3. Channel substrates consist of coarse sand, gravel and cobbles. Large, angular rocks and boulders are also common within the channel. Pools and riffles were observed at various locations along this reach of the River. Turbidity and suspended sediment transport were generally low at the time of the field survey. Turbidity increased notably at the confluence of Chaparral Gulch with the Agua Fria River where a sediment plume could be observed entering the River from Chaparral Gulch. The Agua Fria River provides suitable habitat for a variety of aquatic organisms throughout the reach that extends along the eastern boundary of the Humboldt Smelter site.

10.2 Chaparral Gulch

The reach of Chaparral Gulch that extends from Highway 69 to the tailings dam within the Humboldt Smelter site averages 26 feet in width (bankfull discharge). The channel is only slightly entrenched throughout this reach and it exhibits lower sinuosity than the reach west of Highway 69. The sinuosity ratio is approximately 1.08. The average depth of the downcut above the Humboldt Smelter tailings pile is approximately 2.5 feet, but increases to approximate 3 feet in some locations southeast of the tailings pile. The lower gradient of this reach of Chaparral Gulch causes it to act as a bedload trap. Channel substrates originated from both alluvial and colluvial sources. Colluvial material appears to have originated from the Iron King Mine tailings pile and the Humboldt Smelter tailings pile. Gullies and rills of eroding tailings

are evident along the Humboldt Smelter tailings pile adjacent to Chaparral Gulch. The tailings are found along the banks of the drainage and extend from the tailings pile to the concrete tailings dam. Channel substrates are finer textured (sands, silts and clays) with fewer cobbles and angular rocks than those observed in the upper reach of Chaparral Gulch.

The tailings dam is approximately 24 feet high and 60 feet wide and is located near the southern boundary of the Humboldt Smelter site approximately 0.25 miles from the confluence of Chaparral Gulch with the Agua Fria River. Tailings decant water was flowing from the dam at a rate of less than 1 cfs (visual estimation) when the field survey was conducted. Channel sinuosity is increased throughout this reach of Chaparral Gulch to the confluence with the Agua Fria River. The sinuosity ratio is approximately 1.2.

The high rate of bedload transport of fine material immediately below the tailings dam has resulted in braided channel conditions for approximately 300 feet of this stream reach. A high level of suspended sediments resulting in turbidity was also observed in the water below the tailings dam. Woody debris dams up to three feet high were observed among tree boles immediately below the tailings dam indicating extreme flood flow following large storm events.

Further downstream, the channel becomes confined among boulders, steep hillsides, and basalt rock walls. Pools and increased channel depth were observed along this reach due to the restricted nature of the channel. Water remained turbid throughout this reach of the drainage and was observed introducing additional turbidity to the Agua Fria River at the confluence of Chaparral Gulch with the Agua Fria River. Stream flow of Chaparral Gulch near the confluence with the Agua Fria River was estimated to be approximately 2 cfs.

Chaparral Gulch provides suitable habitat for aquatic organisms from the tailings dam to the confluence with the Agua Fria River. However, habitat quality is severely degraded throughout this reach as a result of the introduction of acidic mine tailings.

10.3 Ephemeral Drainages

Three ephemeral drainages were observed within the Humboldt Smelter site. Two of these drainages originate from the tailings located in the northwest quadrant of the Humboldt Smelter site and have confluences with Chaparral Gulch. These drainages are likely causing degradation of the aquatic environment of Chaparral Gulch through introduction of mine tailings and acidic runoff. The third drainage is located near the southeast corner of the Humboldt Smelter site and has a confluence with the Agua Fria River. The area surrounding this ephemeral drainage is disturbed and the drainage is introducing sediments into the Agua Fria River, but these sediments do not appear to have originated from tailings.

11.0 WILDLIFE SPECIES OBSERVED AT THE HUMBOLDT SMELTER SITE

The only wildlife observed on the Humboldt Smelter site during the field survey was a pair of mourning dove (*Zenaida macroura*), which were observed approximately 300 feet west of the Humboldt Smelter stack.

12.0 OTHER WILDLIFE SPECIES LIKELY TO BE PRESENT AT THE HUMBOLDT SMELTER BASED ON OBSERVED SIGNS

Interviews with mine personnel indicated that a white colored owl is utilizing the Humboldt Smelter stack as a nesting site. Although this information was not conclusively verified during the field survey, two nests were observed on the ladder attached to the side of the stack. One stick nest was located near the top of the stack and another was observed on a small platform attached to the middle of the stack. These nests may have been constructed by common barn owls (*Tyto alba*), but this was not conclusively verified during the field survey as no owls were observed.

Deer tracks and trails were observed at several locations along the Agua Fria River and within Chaparral Gulch near the stream crossing under Highway 69.

13.0 OTHER WATER BODIES LOCATED WITHIN THE IRON KING MINE AND HUMBOLD SMELTER SUPERFUND SITE

Several retention basins/ponds were observed within the Iron King Mine site. Most of these ponds were located near the southeastern portion of the property near the mine shop and facilities. The largest tailings pond, known as Lake Ironite, is located southeast of the large tailings pile immediately below a large blowout area. The water in this pond was bright red and produced a strong sulfidic odor. The pond contained a large amount of tailings, although the retention levee was not breached at the time the field survey was conducted.

Another retention pond was observed adjacent to the entrance road that leads to the mine facilities. This retention pond collects runoff from the southeast portion of the large tailings pile near Highway 69. A culvert was observed at this retention pond that permits overflow from this pond to flow under the mine entrance road and into Chaparral Gulch.

Another retention pond was observed that appears to collect runoff from the northwest portion of the large tailings pile. A white surface residue and oily sheen were observed near the northwestern perimeter of this pond. No release to other surface waters was observed from this retention basin. The pond was inside a barbed-wire enclosure and was therefore not investigated more closely than the enclosure would permit during the field survey.

Other retention areas were observed near the mine shop buildings and decommissioned conveyors. These retention basins were smaller than previously discussed retention ponds, but were nearly filled with tailings. Retained water in these basins was also bright red.

The Glory Hole is a large, open pit located on the western portion of the Iron King Mine site. Water retained at the bottom of the pit was brownish yellow.

Two depressions that had collected rainwater were observed on a tailings deposit in Chaparral Gulch approximately 500 feet northwest of the mine shop building. Cattle hoof prints were observed in one of these depressions. The EPA reported pH measurements 2.28 and 2.41 from rainwater in these depressions on August 28, 2008.

It is unlikely that any of the retention basins or depressional areas where rainwater collects would provide suitable habitat for aquatic organisms. Water found in these areas would likely be extremely acidic.

14.0 SPECIES ANALYSIS FOR LISTED, PROPOSED AND CANDIDATE SPECIES

A total of 16 SSS were analyzed for this BE. Table 6 lists the species that are known to occur or have the potential to occur within Yavapai County, Arizona. Existing literature was researched for each species in order to determine whether or not species and/or their habitat may be affected by the existing conditions at the Iron King and Humboldt Smelter Superfund Site. In addition, field surveys were performed by an EnviroSystems' biologist on August 26, 2008, to determine the presence/absence of species and/or their habitats within the project area. The results of both the literature research and field surveys are summarized in Table 7.

Table 6. Special-Status Species Included in the Biological Evaluation

SCIENTIFIC NAME	COMMON NAME	STATUS[1]
ANIMALS		
Haliaeetus leucocephalus	Bald eagle (desert population)	LT (Yavapai County)
Pelecanus occidentalis	Brown pelican	PE
Rana chiricahuensis	Chiricahua leopard frog	LT
Ptychocheilus lucius	Colorado pikeminnow	LE
Cyprinodon macularius	Desert pupfish	LE SC
Gila intermedia	Gila chub	LE
Poeciliopsis occidentalis	Gila topminnow	LE SC
Pyrgulopsis morrisoni	Page springsnail	LC
Gila nigra	Headwater chub	C
Strix occidentalis lucida	Mexican spotted owl	LT
Xyrauchen texanus	Razorback sucker	LE
Empidonax traillii extimus	Southwestern willow flycatcher	LE
Coccyzus americanus	Yellow-billed cuckoo	C
Bufo microscaphus	Arizona toad	SC
Meda fulgida	Spikedace	LT
PLANTS		
Purshia subintegra	Arizona cliffrose	LE

[1]Status Definition:
LE – Listed Endangered under ESA
LT – Listed Threatened under ESA
PE – Proposed Endangered under ESA
C – Candidate taxon ready for Proposal
SC – Arizona Species of Concern (no regulated protection)

Table 7. Summary of Findings for Iron King Mine and Humboldt Smelter Superfund Site

SCIENTIFIC NAME	COMMON NAME	PREFERRED HABITAT DESCRIPTION	HABITAT PRESENCE
ANIMALS			
Haliaeetus leucocephalus	Bald eagle	Large trees or cliffs near water (reservoirs, rivers, and streams) with abundant prey.	Large trees, cliff and ledges are present in the project area as well as a perennial water body (Agua Fria River).
Pelecanus occidentalis	Brown pelican	Coastal land and islands; species found around many Arizona lakes and rivers.	No suitable habitat present within project area
Rana chiricahuensis	Chiricahua leopard frog	Species occurs in streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs.	The Agua Fria River and the reach of Chaparral Gulch below the tailings dam provide potential habitat.
Ptychocheilus lucius	Colorado pikeminnow	Occurs in rivers with high silt content, warm water, turbulence, and variable flow by season. The last known naturally occurring specimen from Arizona was collected in 1969. Experimental non-essential populations have been reintroduced into the Verde and Salt rivers in Arizona.	Critical habitat is designated in portions of the Colorado, Green, Yainpa, White, and San Juan Rivers in the Upper Basin. There is no critical habitat designated for this species in the Lower Basin. No Colorado pikeminnow have been documented in the project area. Potential habitat does occur within the project area.
Cyprinodon macularius	Desert pupfish	Shallow springs, small streams, and marshes. Tolerates saline and warm water.	No critical habitat has been designated for this species in the project area and none have been documented as occurring in the project area. Critical habitat includes Quitobaquito Spring and pond in Pima County, Arizona; and portions of San Felipe Creek, Carrizo Wash, and Fish Creek Wash in Imperial County, California.
Gila intermedia	Gila chub	Pools, springs, ciénegas, and streams.	The Agua Fria River has two downstream tributaries with stable-threatened populations, Silver and Sycamore creeks (Yavapai County), as well as two unstable-threatened populations in Little Sycamore Creek and Indian Creek.
Poeciliopsis occidentalis occidentalis	Gila topminnow	Occurs in small streams, springs, and ciénegas below 4,500 feet elevation, primarily in shallow areas with aquatic vegetation and debris for cover. Species occurs in small streams, springs, and ciénegas in Gila, Pinal, Graham, Yavapai, Santa Cruz, Pima, Maricopa, and La Paz counties.	Suitable habitat does not occur within or adjacent to the project area. Habitat quality is low due to lack of aquatic vegetation. There are no documented occurrences of the Gila topminnow in the project area.
Pyrgulopsis morrisoni	Page springsnail	Aquatic, slow, or still freshwater usually head springs and upper section of outflows.	The project area does not occur near a head spring or upper outflow area. Suitable habitat for the Page springsnail does not occur in the project area.

Table 7. cont'd.

SCIENTIFIC NAME	COMMON NAME	PREFERRED HABITAT DESCRIPTION	HABITAT PRESENCE
ANIMALS			
Gila nigra	Headwater chub	Headwater chubs occur in the middle to upper reaches of moderately-sized streams. Typical adult microhabitat consists of near shore pools adjacent to swifter riffles and runs over sand and gravel substrate, with young of the year and juveniles using smaller pools and areas with undercut banks and low velocity.	Suitable habitat was observed within the Agua Fria River. The known present range of headwater chub includes 13 streams in the Verde River basin, Tonto Creek subbasin, and San Carlos River basin in Yavapai, Gila, and Graham counties, Arizona. There are no documented occurrences of the headwater chub within the Agua Fria River near the project area.
Strix occidentalis lucida	Mexican spotted owl	Known to nest in high elevation mixed conifer and canyon lands. Also nests in dense forests with multilayered foliage structure. Critical habitat occurs in the Prescott Basin and Crown King areas.	No Mexican spotted owls (MSO) were observed or heard during the site visit which was conducted during daylight hours. No indications of MSO utilizing the project are were found. Suitable habitat for MSO does not occur within the project area.
Xyrauchen texanus	Razorback sucker	Species occurs in backwaters, flooded bottomlands, pools, side channels and other slower-moving habitats. In the Lower Basin, populations are isolated to lakes Mohave, Mead, and the lower Colorado River below Havasu. Populations have been reintroduced into the Verde River.	No suitable habitat for the razorback sucker was observed within the project area water bodies. Although the Agua Fria River exhibits perennial flow in the project area, the flow is too rapid and volume inadequate to support populations of razorback suckers
Empidonax traillii extimus	Southwestern willow flycatcher	Cottonwood/willow and tamarisk vegetation communities along rivers and streams.	No suitable habitat was observed along the Agua Fria River and within the lower reach of Chaparral Gulch below the tailings dam.
Coccyzus americanus	Yellow-billed cuckoo	Species is associated with mature stands of cottonwood-willow riparian deciduous forest. It is also known to use dense thickets comprised of mixed hardwoods species with tamarisk included.	No yellow-billed cuckoos were observed during the biological survey. No suitable habitat was observed in forested riparian corridors along Chaparral Gulch and the Agua Fria River.
Bufo microscaphus	Arizona toad	Rocky streams and canyons in the pine-oak belt of Arizona and New Mexico. Also occurs in lower deserts e.g., Agua Fria River area. In Utah, the species occurs along irrigation ditches and in flooded fields, as well as along streams bordered by willows and cottonwoods. Irrigated cropland and reservoirs are becoming increasingly used.	No Arizona toads were observed during the biological survey. However, suitable habitat was observed in the Agua Fria River and Chaparral Gulch. Arizona toads are known to occur within three miles of the project area.

Table 7. cont'd.

SCIENTIFIC NAME	COMMON NAME	PREFERRED HABITAT DESCRIPTION	HABITAT PRESENCE
ANIMALS			
Meda fulgida	Spikedace	Moderate to large perennial streams with gravel cobble substrates and moderate to swift velocities over sand and gravel substrates. Recurrent flooding regime is important. Presently, in Arizona the spikedace occur only in Aravaipa Creek, tributary to San Pedro River in Graham and Greenlee Counties; and upper Verde River in Yavapai County. In New Mexico, spikedace are found in the East, West, and Middle forks of the Gila River. Its present range is approximately 10-15 percent of its historical range, and is only common in Aravapia Creek and some parts of the upper Gila River in New Mexico.	The project site is located in the Agua Fria River watershed which was in the historic range of the spikedace. However, the project site is near the location where perennial flow initiates. The Agua Fria River is therefore not a moderate to large perennial stream at the project site and does not provide suitable habitat for spikedace.
PLANTS			
Purshia subintegra	Arizona cliffrose	Sonoran desertscrub where the winters are mild, summers are hot, and rainfall is evenly distributed between summer and winter rainfall periods. The species occurs only on limestone formed from Tertiary lakebed deposits.	There are no limestone formed Tertiary lakebed deposits in the project area. No suitable habitat for this species is present within the project site.

14.1 Animals

Name: Bald Eagle
Haliaeetus leucocephalus

Affected Habitat Description

Bald eagles have winter foraging and roosting habitat widespread in northern Arizona (USFWS 1982). Nesting habitat consists of large trees or cliffs near water (reservoirs, rivers, and streams) with abundant prey. Areas selected for wintering habitat have an adequate food supply and open water (AGFD 2002).

Analysis of Effects

No bald eagles were observed during the field survey. No stick nests or other indications of bald eagles utilizing the project area were observed. Winter foraging and roosting habitat was observed within the project area. The Agua Fria River exhibits perennial flow at the project location and large trees, cliffs, and ledges are present within and around the project site. It is possible that bald eagles utilize portions of the project area for foraging or roosting habitat. Continued discharge of mine tailings runoff water to Chaparral Gulch that may subsequently be introduced to the Agua Fria River poses a risk to wildlife prey through direct contact and

ingestion pathways. Reduced prey would negatively impact foraging capability of bald eagles in the project area.

Findings

_____ No effect to species or its habitat
___X___ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Brown Pelican
Pelecanus occidentalis

Affected Habitat Description

Brown pelicans are generally found along coastal areas, with nesting occurring on islands. This species is occasionally found along Arizona's lakes and rivers. Most Arizona records are along the Colorado River including north to Davis Dam and even to Lake Mead (La Paz and Yuma counties), and Gila Valley (Maricopa, Pinal, Mojave and Gila counties) but stragglers reach most of the state (Tolani Lakes, Navajo Indian Reservation, Salt River, and other areas). Populations exist along the California and Mexico coasts.

Analysis of Affects

No brown pelicans were observed or heard during the biological survey. No indications of brown pelican utilization of the subject property were found. No aquatic life was observed in the drainages during the field survey. It is unlikely that brown pelicans would utilize drainages at the project site as these streams are relatively small and confined within steep slopes and rock outcrops. Chaparral Gulch and Galena Gulch do not exhibit perennial flow.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Chiricahua Leopard Frog
Rana chiricahuensis

Affected Habitat Description

The Chiricahua leopard frog was historically an inhabitant of ciénegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 ft in central, east-central, and southeastern Arizona; west-central and southwestern New Mexico; and in Mexico, northeastern Sonora and the Sierra Madre Occidental of northwestern Chihuahua. The Chiricahua leopard frog is now often restricted to springs, livestock tanks, and streams in the upper portions of watersheds where non-native predators either have yet to invade or habitats are marginal.

Analysis of Effects

No Chiricahua leopard frogs were observed in any of the water bodies within or adjacent to the project site. No Chiricahua leopard frogs were heard. Suitable Chiricahua leopard frog habitat was observed within Chaparral Gulch and the Agua Fria River. Undercut stream banks, woody debris, pools, and vegetative ground cover were found in both drainages. These areas provide escape cover, foraging and basking habitat. It is possible that Chiricahua leopard frogs utilize the subject site. Continued discharge of mine tailings and slag runoff water into Chaparral Gulch and the Agua Fria River could increase the concentration of contaminants in surface water and stream sediments that would be harmful to Chiricahua leopard frogs through direct contact or ingestion. Species-specific surveys during the appropriate time of year may be warranted to confirm this determination.

Findings

_____ No effect to species or its habitat
___X___ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Colorado Pikeminnow
Ptychocheilus lucius

Affected Habitat Description

This species occurs in the warm, swift waters of the big rivers of the Colorado Basin. Adults are migratory and inhabit pools and eddies just outside the main current. Young can be found in backwater areas. Historically, the fish was found in the Colorado River and major tributaries in Arizona, New Mexico, Utah, Colorado, and Wyoming.

Colorado pikeminnow are adapted to rivers with seasonally variable flow, high silt loads, and turbulence. Young-of-the-year and juvenile Colorado pikeminnow live in shallow backwater areas, with little or no current over silt and sand bottoms. When they are about 8 inches in length, habitat preferences change with fish seeking deeper water with some velocity. Colorado pikeminnow can tolerate a broad range of temperatures from 35° C in the summer to lower than 10° C in winter. The young become predatory at about 4 inches. Nearly 86 percent of the diet for juveniles is other fish (USFWS 2007). Native populations of the Colorado pikeminnow are now restricted to the Upper Basin in Wyoming, Colorado, Utah, and New Mexico. Colorado pikeminnow populations have been extirpated from the Lower Basin (USFWS 1994).

The USFWS has designated six reaches of the Colorado River System as critical habitat for the Colorado pikeminnow. These reaches total 1,148 miles as measured along the center line of each reach. This represents about 29 percent of the historical habitat of this species. Critical habitat is designated in portions of the Colorado, Green, Yainpa, White, and San Juan Rivers in the Upper Basin. There is no critical habitat designated for this species in the Lower Basin.

Analysis of Effects

No suitable habitat for the Colorado pikeminnow occurs within or adjacent to the project areas. It is unlikely that Colorado pikeminnow utilize water bodies in the project area.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Desert Pupfish
Cyprinodon macularius

Affected Habitat Description

Desert pupfish are found in shallow water of desert springs, small streams, and marshes below 5,000 ft elevation. They are restricted to three natural populations in California and the non-natural irrigation drains around the Salton Sea. Desert pupfish are also found in restricted locations in Sonora and Baja California, Mexico. There are no natural populations of this subspecies remaining in Arizona. The species tolerates high salinities and high water temperatures. Critical habitat includes Quitobaquito Spring and pond in Pima County, Arizona; and portions of San Felipe Creek, Carrizo Wash, and Fish Creek Wash in Imperial County, California. A number of populations are maintained in captivity, including one at Dexter National Fish Hatchery in Dexter, New Mexico.

Analysis of Effects

No critical habitat for the desert pupfish occurs within the project area. Desert pupfish are not known to occur in drainages or springs in the Arizona chaparral biotic community. It is unlikely that desert pupfish utilize water bodies within the project area.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Gila Chub
Gila intermedia

Affected Habitat Description

Gila chub are elusive, preferring quiet, deeper waters, especially pools, or remaining near cover such as cutbanks, boulders, fallen logs, and thick overhanging or aquatic vegetation. Recurrent flooding and a natural hydrograph (physical conditions, boundaries, flow, and related characteristics of waters) are very important in maintaining the habitat of Gila chub and in

helping the species maintain a competitive edge over invading nonnative aquatic species (Propst et al. 1986, Minckley and Meffe 1987).

Gila chub currently occur in small portions of tributary streams within the Gila River basin in Arizona and New Mexico. Weedman et al. (1996) reported 23 isolated populations, much reduced from the species' historical distribution. These 23 populations, plus four additional populations, form the basis of the proposed critical habitat for the species. The four additional populations are in Turkey Creek in New Mexico, and in Mineral Creek, Lousy Canyon, and Larry Creek in Arizona. The Mineral Creek population was discovered in 2000, and Lousy Canyon and Larry Creek were stocked in 1995 with Gila chub translocated from Silver Creek (USFWS 2005).

Analysis of Effects

Suitable habitat for Gila chub was observed in the Agua Fria River and Chaparral Gulch where cutbanks, boulders, pools, coarse woody debris and other suitable cover are found. However, there are no documented occurrences of Gila chub in the Agua Fria River near the project area (Jeff Sorensen, personal communication November 15, 2001). The Agua Fria River has two downstream tributaries with stable-threatened populations, Silver and Sycamore creeks (Yavapai County), as well as two unstable-threatened populations in Little Sycamore Creek and Indian Creek. Segments of six tributaries to the Agua Fria River in Yavapai County have been proposed for critical habitat designation: Little Sycamore Creek, Sycamore Creek, Indian Creek, Silver Creek, Larry Creek, and Lousy Canyon. Ongoing uncontrolled discharge of mine tailings and runoff water from tailings and slag piles into Chaparral Gulch and the Agua Fria River could result in habitat degradation through contamination of streambed sediments and surface waters.

Findings

_____ No effect to species or its habitat
___X___ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Gila Topminnow
Poeciliopsis occidentalis

Affected Habitat Description

Gila topminnows occur in small streams, springs, and ciénegas below 4,500 ft elevation, primarily in shallow areas with aquatic vegetation and debris for cover. They can tolerate relatively high water temperatures and low dissolved oxygen. The species occurs in small streams, springs, and cienegas in Gila, Pinal, Graham, Yavapai, Santa Cruz, Pima, Maricopa, and La Paz counties. The Gila topminnow has been released at almost 200 locations in efforts to reestablish populations. The species occurs in Mexico and Arizona. In Arizona, most of the remaining native populations are in the Santa Cruz River system. Species occurs in small streams, springs, and ciénegas in Gila, Pinal, Graham, Yavapai, Santa Cruz, Pima, Maricopa, and La Paz counties. Gila topminnows are not known to inhabit the Agua Fria River. The closest

known populations of Gila topminnow to the project area occur in the Salt River and Tonto Creek which are in a different watershed and are more than 80 miles from the project site.

Analysis of Effects

Suitable habitat for the Gila topminnow was not found in the project area. Although the Agua Fria River is best characterized as a small, shallow stream on the project site, there is not sufficient aquatic vegetation or debris to provide adequate cover. It is unlikely that Gila topminnow would utilize this reach of the Agua Fria River.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Page Springsnail
Pyrgulopsis morrisoni

Affected Habitat Description

Hydrobiid snails occur in springs, seeps, marshes, spring pools, outflows, and diverse lotic (flowing) waters. The most common habitat for *Pyrgulopsis* snails is a rheocrene, or a spring emerging from the ground as a flowing stream. Page springsnail habitats are isolated, midelevational (3,510 feet), permanently saturated, spring-fed aquatic climax communities commonly described as ciénegas (Hendrickson and Minckley 1984). Substrate is typically firm and characterized by cobble, gravel, woody debris, and aquatic vegetation. These substrate types provide a suitable surface for grazing and egg laying (Taylor 1987, Hersler 1998). The species is primarily found in a series of springs located within an approximately one-mile area along the west side of Oak Creek around the community of Page Springs, Yavapai County.

Analysis of Effects

Page springsnails generally require permanent springs, seeps, marshes and running water where they can attach to firm substrates such as cobble, rocks, woody debris and plants. No natural rheocrene habitat is found within or immediately adjacent to the project area. It is unlikely that Page springsnails utilize water bodies found on the subject property.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Headwater Chub
Gila nigra

Affected Habitat Description

Headwater chubs occur in the middle to upper reaches of moderately-sized streams (Minckley and Demaris 2000). Bestgen and Propst (1989) examined status and life history in the Gila River drainage in New Mexico and found that headwater chubs occupied tributary and mainstem habitats in the Gila River at elevations of 4,347 feet to 6,562 feet Maximum water temperatures varied between 20º to 27º C, and minimum water temperatures were around 7º C (Bestgen and Propst 1989, Barrett and Maughan 1995). Typical adult microhabitat consists of nearshore pools adjacent to swifter riffles and runs over sand and gravel substrate, with young of the year and juveniles using smaller pools and areas with undercut banks and low velocity (Anderson and Turner 1978, Bestgen and Propst 1989). Spawning in Fossil Creek occurred in spring and was observed in March in pool-riffle areas with sandy-rocky substrates. Neve (1976) reported that the diet of headwater chub included aquatic insects, ostracods, and plant material (USFWS 2007).

The range of the headwater chub has been reduced by approximately 50 to 60 percent. Approximately 16 streams (125 miles (200 kilometers) of stream) are thought to be occupied out of 19 streams (312 miles (500 kilometers) of stream) formerly occupied in the Gila River Basin in Arizona and New Mexico.

The known present range of headwater chub includes 13 streams in the Verde River Basin, Tonto Creek subbasin, and San Carlos River Basin in Yavapai, Gila, and Graham counties, Arizona.

Analysis of Effects

Suitable habitat for headwater chub was observed at the confluence of Chaparral Gulch with the Agua Fria River. However, there are no documented occurrences of the headwater chub within the reach of the Agua Fria River adjacent to the project site. The reach of the Agua Fria River at the project site is best characterized as a middle to upper reach of the River. Pools adjacent to swifter riffles occur at the confluence of Chaparral Gulch and the Agua Fria River. It is possible, though unlikely that headwater chub would utilize the Agua Fria River or Chaparral Gulch within or adjacent to the project site. Continued discharge of mine tailings and stormwater runoff from tailings and slag piles would likely contaminate surface waters and streambed sediments, degrading habitat quality in areas that could be utilized by headwater chub.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Mexican Spotted Owl
Strix occidentalis lucida

Affected Habitat Description

Mexican Spotted Owls (MSO) occur in varied habitat, consisting of mature montane forest and woodland, shady wooded canyons, and steep canyons. In forested habitat, uneven-aged stands with a high canopy closure, high tree density, and a sloped terrain appear to be key habitat components. They can also be found in mixed conifer and pine-oak vegetation types. Generally nests in older forests of mixed conifer or ponderosa pine/Gambel oak. Nests are found in live trees in natural platforms (dwarf mistletoe brooms), snags, and on canyon walls. Elevation ranges from 4,100 to 9,000 feet.

Analysis of Effects

The project area does not contain any suitable habitat for MSO. There is moderate tree density, and no canopy closure. Steep rock outcrops are generally less than 20 feet high. The closest designated critical habitat for MSO to the project area is located approximately 6.8 miles to the west in the Prescott National Forest. It is unlikely that MSO utilize the project area.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Razorback Sucker
Xyrauchen texanus

Affected Habitat Description

Historic riverine systems provided a wide variety of habits including backwaters, sloughs, oxbow lakes, and seasonally inundated flood plains, which were used to satisfy various life history requirements (Holden and Stalnaker 1975; Lanigan and Tyus 1989). Adult razorback suckers prefer shallow swift waters of mid-channel sandbars (less than 12 feet deep) during the summer months, and slow runs, slack waters and eddies (2.0 to 4.6 feet) in the winter. In the lower Colorado River Basin, razorback suckers occurred from the Colorado River delta upstream to Lees Ferry, Arizona (USFWS 1998). Historically razorback suckers inhabited the Colorado, Gila, Salt, Verde, and San Pedro rivers. Presently natural adult populations exist only in Lake Mohave, Lake Mead, and Lake Havasu (AGFD 2002).

The USFWS determined critical habitat for the razorback sucker in a final rule published on March 21, 1994 (59 FR 13374). Fifteen river reaches covering about 49% of the historic habitat of the razorback sucker (1,724 miles) were designated within the Colorado River basin. Included are portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan rivers in the upper Colorado River Basin, and portions of the Colorado, Gila, Salt, and Verde rivers in the lower Colorado River Basin. The designated areas contain habitats within the 100-year floodplain that will meet the needs of the razorback sucker as defined by primary constituent

elements (USFWS 1998). The closest critical habitat for the razorback sucker is in the Verde River from Prescott National Forest Boundary to Horseshoe Lake. Hatchery-raised individuals have been stocked since in this reach 1981 with moderate success.

Analysis of Effects

The Agua Fria River at the project site does not provide suitable habitat for the razorback sucker due to the shallow depth of the channel and headwater characteristics. It is unlikely that razorback suckers utilize the Agua Fria River in or adjacent to the project area.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Southwestern Willow Flycatcher
Empidonax traillii extimus

Affected Habitat Description

The southwestern willow flycatcher occurs throughout major watersheds in Arizona during the breeding season in dense riparian vegetation associated with rivers, swamps, lakes, reservoirs, and other wetlands or saturated soils. Southwestern willow flycatchers are found from near sea level to over 8,500 feet in elevation, but are primarily found in lower elevation riparian habitats. Nest sites typically have dense foliage from ground level up to approximately 20 feet above-ground, although dense foliage may exist only at the shrub level, or as a low-dense canopy. Nests occur in native trees such as willow and boxelder, sometimes with a scattered overstory of cottonwood, or in non-native trees such as tamarisk or Russian olive. Nests are small, open-cupped, and constructed of leaves, grass, fibers, feathers, and animal hair. Coarser material is used in the nest base and body, and finer materials are used in the nest cup. These flycatchers are insectivores, foraging within and above the canopy, along the patch edge, in openings within the territory, and above water.

Analysis of Effects

The closest designated critical habitat to the project site is the Verde River, which is approximately 20 miles northeast of the project area. No records exist that indicate that the Southwestern willow flycatcher occurs in the project area. Riparian vegetation within the project area does not constitute preferred habitat for southwestern willow flycatchers due to inadequate width of the riparian corridors along the Agua Fria River and Chaparral Gulch. It is unlikely that Southwestern willow flycatchers utilize the riparian corridors along the Agua Fria River or Chaparral Gulch.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Yellow-billed Cuckoo
Coccyzus americanus

Affected Habitat Description

Yellow-billed cuckoos breed in large blocks of riparian habitats (particularly woodlands with cottonwoods and willows, while eastern cuckoos breed in a wider range of habitats, including deciduous woodlands and parks (Ehrlich et al. 1988). Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where the species has been studied in California (Laymon et al. 1993). It is also known to use dense thickets comprised of mixed hardwoods species with tamarisk included.

Analysis of Effects

No yellow-billed cuckoos were observed during the biological assessment of riparian areas on the project site. No yellow-billed cuckoos were heard and no indications of their presence were found. Marginal habitat was found within the project area along the Agua Fria River and Chaparral Gulch where mature cottonwoods and willows are common. Understory species density is moderate and riparian corridor width is not sufficient to provide preferred habitat quality.

Findings

_____ No effect to species or its habitat
___X___ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

Name: Arizona Toad
Bufo microscaphus

Affected Habitat Description

This species primarily utilizes rocky stream courses in pine-oak zone in Arizona and New Mexico. In Utah, Arizona toads occur along irrigation ditches and in flooded fields, as well as along streams bordered by willows and cottonwoods (Stebbins 1954). Irrigated cropland and reservoirs are increasingly being used (Price and Sullivan 1988). Arizona toads lay eggs among gravel, leaves, or sticks, or on mud or clean sand, at bottom of flowing or shallow quiet waters of perennial or semipermanent streams (Dahl et al. 2000) or shallow ponds.

Analysis of Effects

Arizona toads are known to occur within three miles of the project site. No Arizona toads were observed during the biological survey of the project area. However, suitable habitat was observed within and along the Agua Fria River and Chaparral Gulch. Continued erosion of mine tailings and stormwater runoff from tailings and slag piles increases channel substrate contamination, bedloading, and water quality degradation. These impacts would likely result in degraded habitat quality and potential exposure of Arizona toads to contamination through direct contact or ingestion. This species is listed as a species of concern in Arizona and is not federally protected.

Findings

_____ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
___X___ Likely to adversely affect species or its habitat

Name: Spikedace
Meda fulgida

Affected Habitat Description

The spikedace require perennial streams, where they inhabit shallow riffles with sand, gravel, and rubble substrates free of fine sedimentation; moderate to swift currents; and swift pools over sand or gravel substrates. This species has been eliminated from 85-90 percent of its formerly occupied habitat due to the introduction and spread of nonnative aquatic species that prey on and compete with them, and habitat loss and degradation from a variety of actions (USFWS 2005). Presently, in Arizona the spikedace occur only in Aravaipa Creek, tributary to San Pedro River in Graham and Greenlee Counties; and upper Verde River in Yavapai County. The nearest proposed critical habitat is the in the Verde River in Yavapai County, Arizona. However, this proposed critical habitat unit is being considered for removal from designation due to economic considerations.

Analysis of Effects

Suitable habitat for the spikedace does not occur at the project area in either Chaparral Gulch or the Agua Fria River due to channel substrates that include silt and clay. Pools are infrequent in this reach of the Agua Fria River until the confluence of Chaparral Gulch where turbidity increases due to suspended sediments that are introduced to the Agua Fria River from Chaparral Gulch. It is unlikely that spikedace would utilize water bodies in the project area.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

14.2 Plants

Name: Arizona Cliffrose
Purshia subintegra

Affected Habitat Description

Arizona cliffrose occurs in the Sonoran desertscrub where the winters are mild, summers are hot, and the 22.9-86 centimeters (cm) 19-34 inches) of rainfall is evenly distributed between summer and winter rainfall periods. The species occurs only on limestone formed from Tertiary lakebed deposits. Threats include livestock and burro grazing, poor reproduction, mineral exploration and development, construction and maintenance of roads and utility corridors, recreation, off-road vehicle (ORV) use, urbanization, pesticides, and inundation (USFWS 1995).

Analysis of Effects

No Arizona cliffrose were found during the biological survey of the project area. Suitable habitat for the Arizona cliffrose was not found on the project site as no Tertiary lakebed deposits occur on the properties. It is unlikely that Arizona cliffrose would occur in the project area.

Findings

___X___ No effect to species or its habitat
_____ May effect species, not likely to adversely affect species or its habitat
_____ May beneficially affect species or its habitat
_____ Likely to adversely affect species or its habitat

15.0 CONCLUSIONS

The Iron King Mine and Humboldt Smelter Superfund Site provides habitat for a variety of wildlife species including terrestrial invertebrates such as insects and spiders, small and large mammals, birds, reptiles, and aquatic organisms. These habitats occur in both undisturbed and disturbed areas including structures found on the properties. Undisturbed areas of Arizona chaparral and the riparian corridor adjacent to the Agua Fria River provide the highest quality habitats observed within the project area, although wind blown tailings particulates would likely pose an inhalation risk throughout the site, depending on wind velocity and direction and duration of exposure. Structures found on the project site provide escape cover, foraging, nesting and roosting habitat. Remaining areas present threats to a variety of wildlife species through multiple pathways. Tailings piles and waste rock areas pose risks to browsing and foraging wildlife through possible direct contact and ingestion of metals, and other chemical contaminants and inhalation of tailings particulates. Surface water impoundments on the Iron King Mine site constitute an attractant hazard to terrestrial wildlife through direct contact and ingestion of contaminated runoff and leached metals from tailings piles. Mine tailings that have been introduced to Chaparral Gulch from both the Iron King Mine site and the Humbold Smelter site have degraded riparian and aquatic habitat through potential contamination of channel substrates and surface water, and increased bedload and sediment transport. A sediment plume was observed entering the Agua Fria River at the confluence of Chaparral Gulch. It is possible that negative impacts to channel substrates and water quality within the Agua Fria River have

occurred downstream of the confluence of Chaparral Gulch. Slag and ash from the Humboldt Smelter that have been deposited near the Agua Fria River may be impacting water quality within the River through contaminated stormwater runoff.

Two federally listed species have an elevated potential to occur on the project site: The Chiricahua leopard frog and the Gila chub. Species-specific surveys may be warranted to conclusively determine the presence or absence of these species within the project area.

The Arizona toad is a species of special concern under the ESA. Such species receive no legal protection. However, the ESA recognized that such species might be in need of conservation action ranging from a need for periodic monitoring of populations and threats to the species and its habitat, to the necessity for listing the species as threatened or endangered.

16.0 SIGNATURE OF DOCUMENT PREPARER

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kmacdonald@esmaz.com

17.0 REFERENCES

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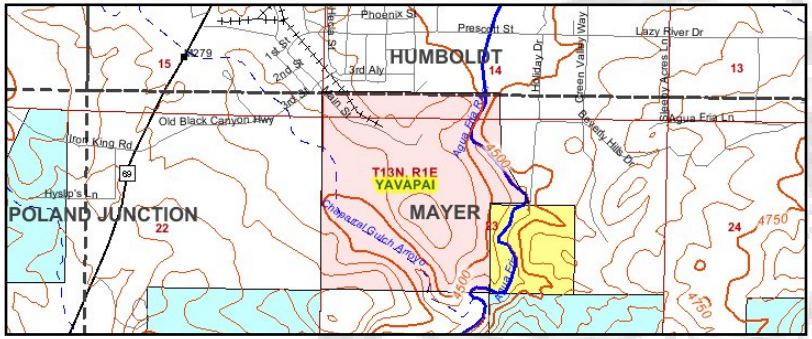
APPENDIX A

Arizona Game and Fish Heritage Data Management System Report

Arizona's On-line Environmental Review Tool
Search ID: 20080801006541
Project Name: Humboldt Smelter Site
Date: 8/1/2008 4:37:55 PM

Project Location



The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	ESA	USFS	BLM	State
Bufo microscaphus	Arizona Toad	SC	S		

Project Name: Humboldt Smelter Site
Submitted By: Stephanie Treptow
On behalf of: EPA
Project Search ID: 20080801006541
Date: 8/1/2008 4:37:49 PM
Project Category: Mining,Tailings Pile Reclamation
Project Coordinates (UTM Zone 12-NAD 83): 386747.910, 3817843.838 meter
Project Area: 188.100 acres
Project Perimeter: 3666.311 meter
County: YAVAPAI
USGS 7.5 Minute Quadrangle ID: 898
Quadrangle Name: HUMBOLDT
Project locality is currently being scoped

Location Accuracy Disclaimer

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

 APPLICATION INITIALS: _____

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

 APPLICATION INITIALS: _____

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Mining,Tailings Pile Reclamation

Project Type Recommendations:

Consider incorporating project components that may allow for the inclusion to promote, enhance, create, or restore wildlife habitat. Contact Project Evaluation Program for further information and opportunities - http://www.azgfd.gov/inside_azgfd/agency_directory.shtml.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (including spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).**
7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

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 APPLICATION INITIALS: _____

time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.
4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.
5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

Signature:_____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

 APPLICATION INITIALS: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

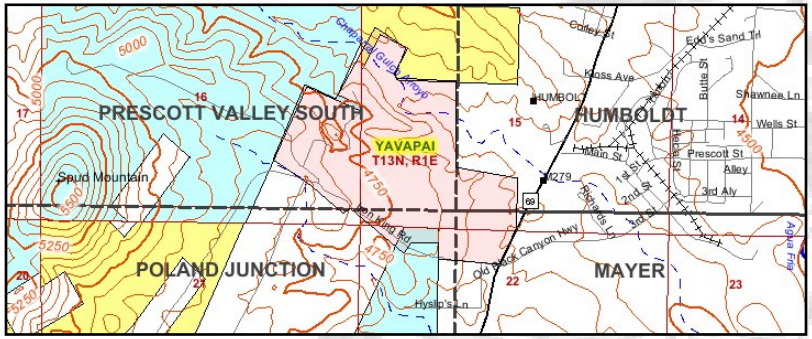
Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____

Arizona's On-line Environmental Review Tool
Search ID: 20080801006542
Project Name: Iron King AOI
Date: 8/1/2008 5:24:59 PM

Project Location



Project Name: Iron King AOI
Submitted By: Stephanie Treptow
On behalf of: ACOE
Project Search ID: 20080801006542
Date: 8/1/2008 5:24:53 PM
Project Category: Mining,Tailings Pile Reclamation
Project Coordinates (UTM Zone 12-NAD 83): 384948.455, 3818566.683 meter
Project Area: 199.781 acres
Project Perimeter: 4384.626 meter
County: YAVAPAI
USGS 7.5 Minute Quadrangle ID: 896
Quadrangle Name: PRESCOTT VALLEY SOUTH
Project locality is currently being scoped

Location Accuracy Disclaimer

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	ESA	USFS	BLM	State
Bufo microscaphus	Arizona Toad	SC	S		

 APPLICATION INITIALS: _____

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

 APPLICATION INITIALS: _____

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Mining,Tailings Pile Reclamation

Project Type Recommendations:

Consider incorporating project components that may allow for the inclusion to promote, enhance, create, or restore wildlife habitat. Contact Project Evaluation Program for further information and opportunities - http://www.azgfd.gov/inside_azgfd/agency_directory.shtml.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (including spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).**
7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

Terms of Use

By using this site, you acknowledge that you have read and understand the terms of use. Department staff may revise these terms periodically. If you continue to use our website after we post changes to these terms, it will mean that you accept such changes. If at any

 APPLICATION INITIALS: _____

time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.
4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.
5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

Signature:_____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

 APPLICATION INITIALS: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____

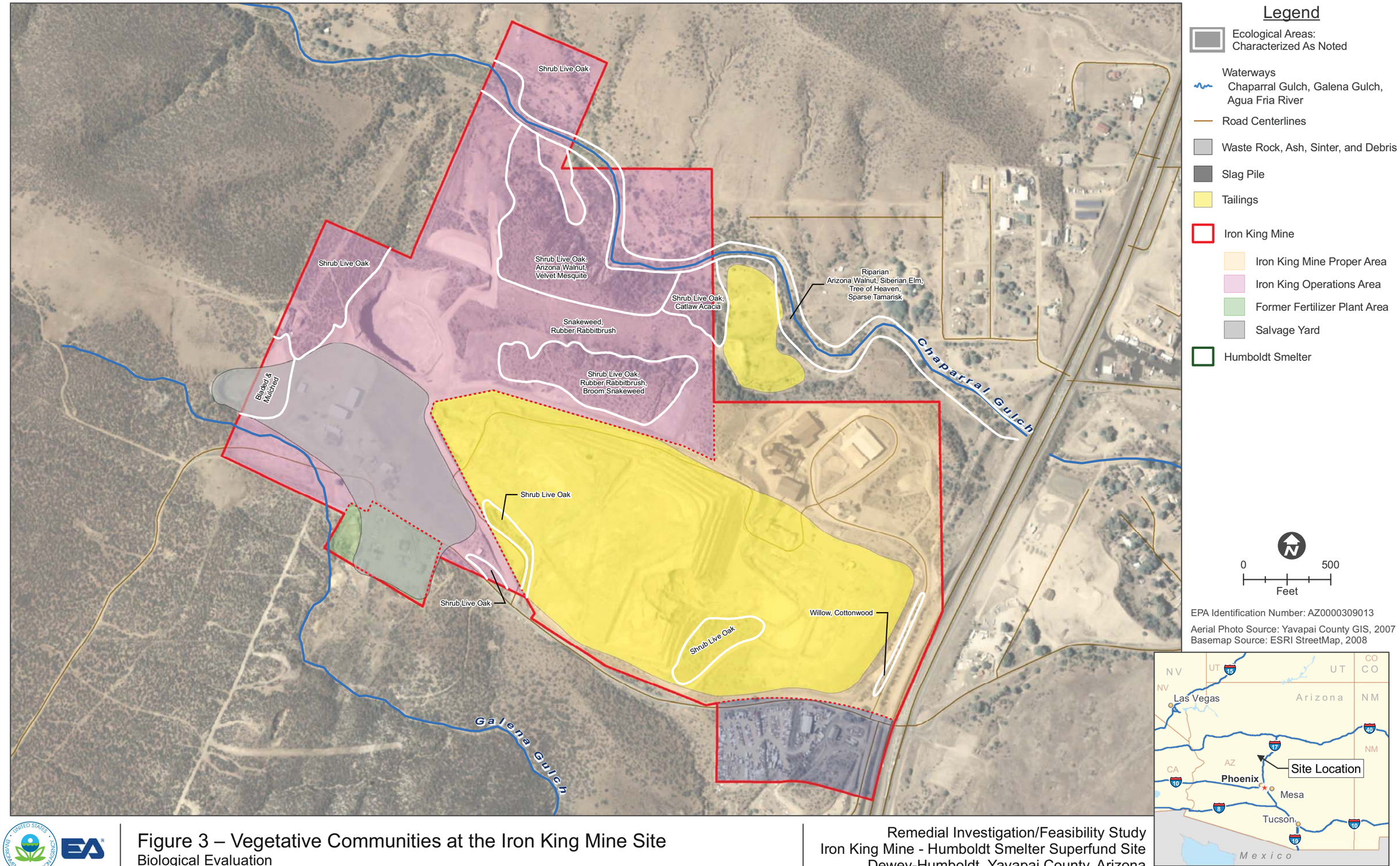


Figure 3 – Vegetative Communities at the Iron King Mine Site
Biological Evaluation

Remedial Investigation/Feasibility Study
Iron King Mine - Humboldt Smelter Superfund Site
Dewey-Humboldt, Yavapai County, Arizona

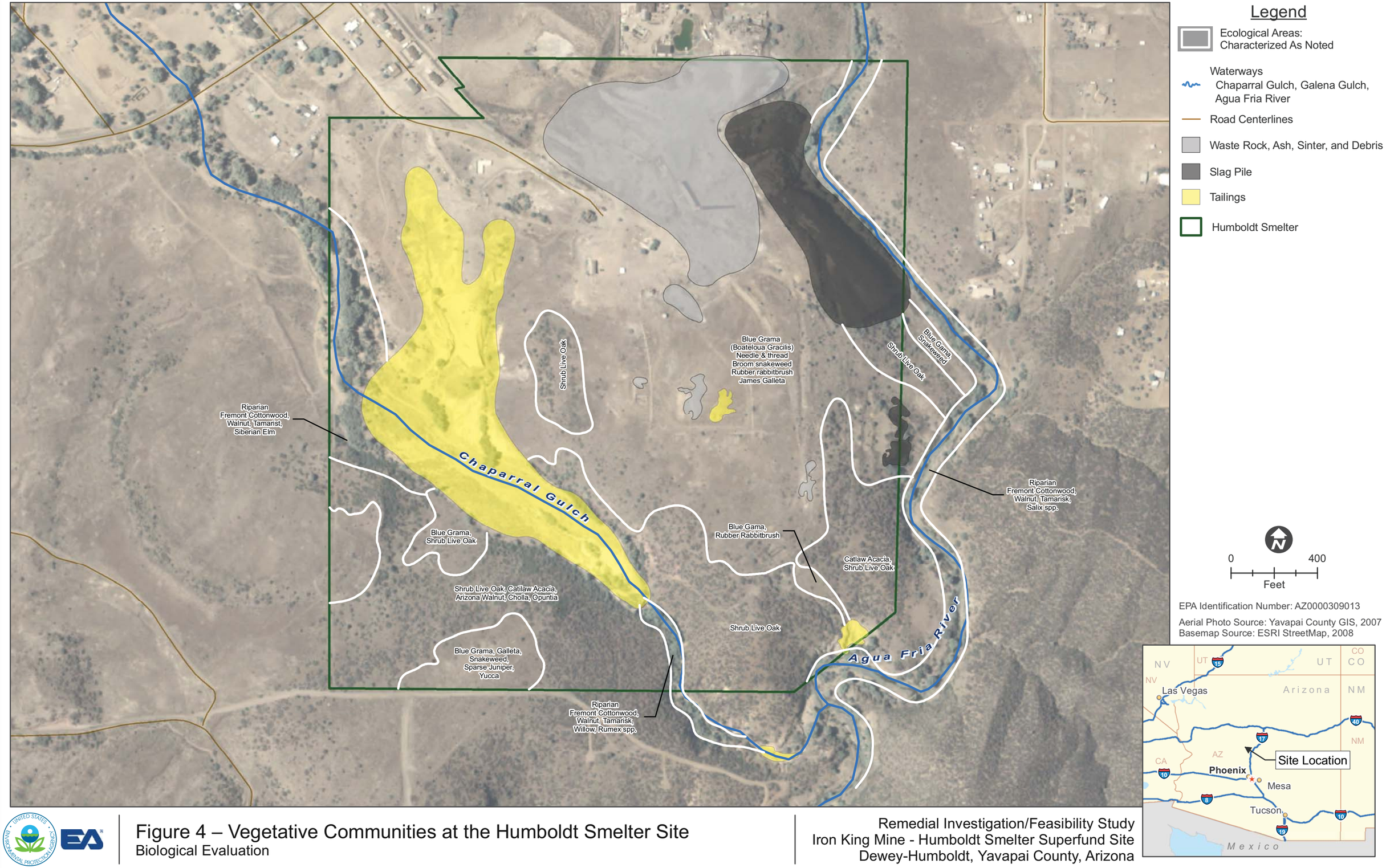


Figure 4 – Vegetative Communities at the Humboldt Smelter Site

Biological Evaluation

Remedial Investigation/Feasibility Study
Iron King Mine - Humboldt Smelter Superfund Site
Dewey-Humboldt, Yavapai County, Arizona