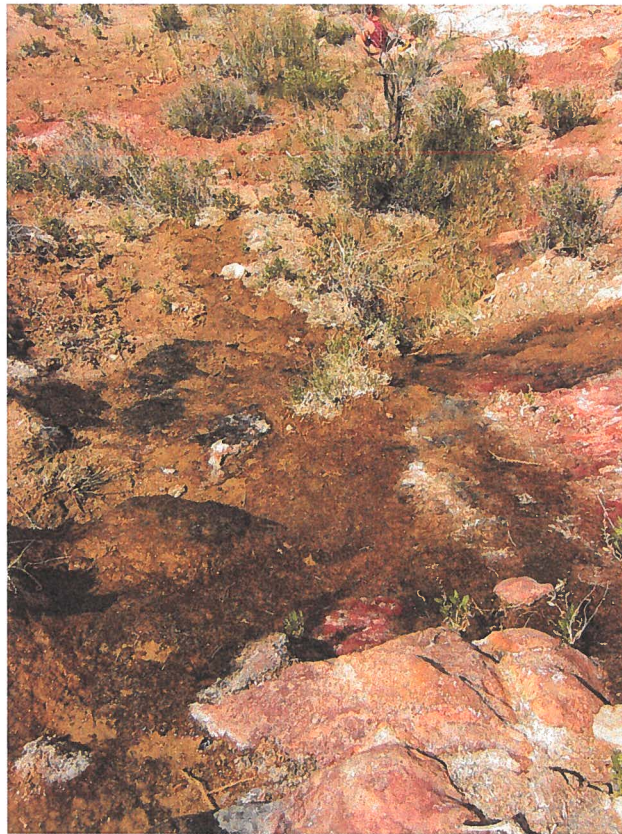


2005 Spring Inventory

Pakoon Demo Area



2005 Pakoon Basin Spring Inventory

Getting Started

To begin the project, we designated the Pakoon Basin as our demo area. This was decided for several reasons. Primarily, we knew that the area was going to be accessible for most of the winter and the roads wouldn't be washed out. It was also beneficial that there was a high frequency of springs in the localized area of the Pakoon Basin.

After discussing with various personnel in the office, and evaluating the potential uses for our database, we decided to develop a GIS database. This is easier to update, more accessible and user-friendly than an Access database.

We started with five separate databases (from the Arizona Wildlands Council, USGS, the range database, and two in-house inventories) of previously done surveys, all with incomplete or inaccurate data. We did a spatial selection on these databases, highlighting all of the supposed springs in the demo region. We then merged the databases together and developed a theme called

N:\Projects\para_springs\work\compiled_springs. After eliminating the three areas in the Pakoon Basin that were very developed and where the water had been extremely diverted from its natural paths (i.e. Pakoon Spring, Tassi Spring and Seven Springs), we had a total of 50 unverified locations for springs.

To develop the protocol and required data elements, we combined methods and requirements from the National Park Service Mojave Inventory and Monitoring Network, Bureau of Land Management *Guide to Managing, Restoring, and Conserving Springs in the Western United States*, and from personnel in our offices.

Protocol

We were performing a Level I survey, which is intended to be a tool that provides information to characterize spring resources and provide a preliminary indication of management tools. Level II and Level III surveys include protocols to quantify spring biota and spring physicochemical features. Our initial key goals for our Level I survey were to:

1. Verify the location of the springs using a GPS unit,
2. Create an easily updated, user-friendly and searchable spring database, and
3. Obtain general biotic, abiotic and taxonomic richness characteristics of the springs surveyed.

Before going out into the field, it is important to research the sites which will be visited. This means looking at aerial photographs, looking through the JDR files (if there are any) and talk to the range cons for those allotments.

In GIS, it is advisable to create waypoints on the positions of the unverified springs.

Equipment needed

When going out in the field, make sure to bring the following items:

1. A charged GPS unit
2. Clipboard with field form
3. Digital camera
4. Conductivity meter, dissolved oxygen and pH meter
5. Tape measure (metric)

6. Ruler (metric)
7. Kitchen sieve
8. Tupperware container
9. 1 liter water bottle

When out in the field, you will be verifying all locations, whether there is a spring there or not. Create a separate rover file for incorrect locations where you visited, but there was not a spring. It is best to create separate rover files for each verified spring for easier downloading when back in the office. Fill out field forms in addition to filling out the data dictionary on the GPS unit.

Level I Protocol & Data Elements

Unique ID Number: (*ID_Number*)

This is a unique character code given to each verified spring in order to facilitate future data searches. When a spring is verified in the field, the ID number is given using the following schema: S (for the spring surveyed) 05 (for the year of the survey) 0001 (for the individual spring) = **S05-0001**.

In the Pakoon demo area, we have reached S05-0015. It is a good idea to assign ID numbers after having gone out in the field so that ID numbers aren't given out to unverified springs.

Surveyor Name:

This is the name of the lead person conducting the survey.

UTMN & UTME:

Record the UTM location of the source of the spring/seep. This should be done in the North American Datum of 1983 (NAD83) in Zone 12.

Spring Name: (*Spring_Name*)

Record the known name, if there is one, of the spring.

Date of Survey: (*Survey_Date*)

Record the date the survey is taking place.

Source Type: (*Spring_Type*)

Record the type of spring being surveyed based upon the following descriptions:

Rheocrene: a spring that discharges into a defined channel

Limnocrene: a spring that discharges into a ponded or pooled habitat

Helocrene: a spring that discharges into a marshy, shallow area (opposed to an open pond or pool)

Seep: Areas where groundwater discharges to the land surface, often at the base of steep slopes, but where water volume is too small to create a stream or creek.

These wetlands have a perpetually saturated soil but may have little or no standing water. These areas are less permanent and smaller than a helocrene area

Unknown: a spring that is highly disturbed through development and impoundment

Other: a spring that does not fit into the above categories. Be sure to describe as such in the **Notes** section.

Development: (*Development*)

Indicate whether the spring has been developed or not. This gives an indication to the permanence of the spring water. When back in the office, search the JDR database (<S:\Blmshare\JDR files\JDR.mdb>) for project files on developed databases. You may search this by project name, JDR number or township & range. Make a copy of the paper field form and put it the folder.

Enclosure: (*Enclosure*)

Indicate whether the spring has been enclosed by a fence or not.

Wildlife Accessibility: (*Wildlife_a*)

Indicate if the spring water is accessible to wildlife and not covered, or if the fence excludes wildlife from reaching the water.

Condition: (*Mainneed*)

Record the condition of the spring and its development according to the categories below:

Abandoned: Spring is beyond repair, looks as though it has not been used in a long time.

Rebuild: Major construction needed. More than just tools are needed to be brought in to fix damage and the overall function of the development is impeded.

Repair: Simple repairs only. Tools are all that are needed and the overall function of the development is not interrupted

Maintain: No repairs needed.

Repairs Needed: (*Repair_nee*)

Write down the specific repairs that are needed to be performed. If necessary, sketch diagram on back of sheet.

Discharge: (*Flow_rate*)

Estimate the spring discharge in liters/minute. Accuracy for this element is a relative term as most of the springs measured are small, shallow and broadly and unevenly spread over a wide area. The discharge of the springs often change throughout the day, seasonally or annually.

Discharge is measured by holding a one liter bottle under a point of moving water and time how long it takes to fill up, converting the result into liters per minute. If there is no spot in the spring channel which allows catching water in the bottle, attempt to build a dam or spout in order to do so. If all else fails, simply estimate discharge in liters per minute. When combined with water width, depth and spring brook length, the estimated discharge provides sufficient information to characterize spring discharge rates.

Spring Brook Length: (*Sprin_len*)

Measure length by counting paces from the source of the spring to the downstream limit of the surface water. Record length by converting number of paces into meters.

Depth: (*Depth*)

Record the water depth of spring in an area which represents the common depth found throughout the aquatic habitat. Use a ruler to measure the vertical distance from substrate to water surface in centimeters

Width: (*Width*)

Record the width of the stream in an area which represents the common width found throughout the aquatic habitat. Use a ruler or tape measure to measure the distance covered by water that lies between banks of the spring brook, less islands, emergent rocks, etc., in centimeters.

Water Temperature: (*Water_temp*)

Record the water temperature in degrees Centigrade using either the dissolved oxygen, conductivity or pH meters. Generally, it is best to put the meter in the spring water upon arrival at the spring in order for the meter to have enough time to register and stabilize before recording the data.

pH: (*pH*)

Record pH using a hand-held field meter. Generally, it is best to put the meter in the spring water upon arrival at the spring in order for the meter to have enough time to register and stabilize before recording the data.

Conductivity: (*Conductivi*)

Record electrical conductivity (EC) in microsiemens (μS or μmhos) using a hand-held field meter. Generally, it is best to put the meter in the spring water upon arrival at the spring in order for the meter to have enough time to register and stabilize before recording the data.

Dissolved Oxygen Concentration: (*Dissolved_*)

Record dissolved oxygen (DO) in milligrams per liter using a hand-held field meter. Generally, it is best to put the meter in the spring water upon arrival at the spring in order for the meter to have enough time to register and stabilize before recording the data.

Public Accessibility: (*Public_acc*)

Record the ease at which the general public could visit the spring according to the categories below:

- 1: Site inaccessible; access only by cross-country hiking.
- 2: Site can be accessed only by arduous trail hike (e.g., greater than 5 miles).
- 3: Site accessed by easy trail hike (e.g., between 1 – 5 miles).
- 4: Site easily accessed by walking less than 1 mile.
- 5: Site immediately adjacent to road.

Substrate Composition: (*Fines, Sand, Gravel, Cobble, Boulder, Bedrock*)

Record the proportional composition of substrate material by indicating percentage. Materials are categorized according to the Wentworth particle size classification:

Fines: <1mm

Sand: 1mm – 5mm

Gravel: >5mm – 80mm

Cobble: >80mm – 300mm

Boulder: >300mm

Bedrock

Percent Cover of Emergent Vegetation: (*Emerg_veg*)

Record to the nearest 10 percent the vegetative, debris or other material that arises within the water width and covers the water surface.

Percent Cover of Vegetative Bank Cover: (*Veg_bank_c*)

Record to the nearest 10 percent the proportion of spring brook banks that is covered by live vegetation.

Tree/Woody Vegetation: (*Tree1, Tree2*)

Write down the two most prominent tree or large woody species (if there are any) in the aquatic area. Salt Cedar (*Tamarisk* sp.) should be included under Non-native species below.

Non-native Species: (*Non-native, Non-nativ2*)

Write down the two most prominent Non-native species in the aquatic area. Refer to *Arizona's Invasive Weeds* hand book for identifying weeds.

Springsnails: (*Spring_sna*)

Note the presence and abundance of springsnails (most likely *Pyrgulopsis* or *Tryonia*). This is done by slightly digging into the substrate with a metal kitchen sieve. It is preferred if three or four scoops are done in differing areas of the spring. Record if the snails are absent, rare, common or abundant.

Springsnails are very small (<1mm – 5mm) crenobiontic species and are usually black or brown. *Pyrgulopsis* are round and slightly inflated and usually found in gravel or cobble substrates in areas with higher water velocity. *Tryonia* are usually elongate and found in slow currents where there are fine substrates.

Other Invertebrates: (*Invertebra*)

While looking for springsnails, inspect the kitchen sieve for other aquatic invertebrates. Record if the invertebrates are absent, rare, common or abundant.

Fish: (*Fish*)

Record if fish are absent, rare, common or abundant.

Amphibians: (*Amphibians*)

Record if amphibians are absent, rare, common or abundant in the habitat surrounding the spring.

Reptiles: (*Reptiles*)

Record if reptiles are absent, rare, common or abundant in the habitat surrounding the spring.

Birds: (*Birds*)

Record if birds are absent, rare, common or abundant in the habitat surrounding the spring.

Mammals: (*Mammals*)

Record if mammals or signs of mammals are absent, rare, common or abundant in the habitat surrounding the spring.

Site Condition: (*Site_condi*)

Assess the disturbance of the spring based upon the categories below. Most springs have been disturbed by some historical activity, natural or cultural. Totally undisturbed springs are believed to be rare, and therefore all sites that appear to unaffected by cultural or natural factors should be categorized as undisturbed.

Undisturbed: Site appears unaffected by recent or historical activity.

Slightly disturbed: Site exhibits little evidence that vegetation or soil had been disturbed. Slight signs of browsing or foraging, animal footprints and scat; evidence of fire or flooding in the distant past.

Moderately disturbed: Site exhibits evidence of recent disturbance where there is still >50% vegetation cover on the spring brook banks and at least 50% of natural discharge remains within the natural spring brook. Neither the spring nor spring brook has been impounded, however there may be evidence of flooding, fire, ungulate grazing, diversion into pipes, etc., or recreation.

Highly disturbed: Site has <50% if its bank covered by vegetation, brook contains <50% of natural discharge. Source is impounded or dredged. Disturbances include drought, recent fire, frequent flooding, intensive ungulate grazing, diversion, dredging or recreation.

Primary Disturbance Cause: (*Disturbanc*)

Identify primary cause of disturbance. There are a limited number of cultural and natural factors known to affect arid land springs: livestock, recreation, diversion, residence, drying, fire, flooding, dredging, and drought.

Notes: (*Notes*)

Include any pertinent notes.

Take Photo:

Take at least two digital photographs, one looking downstream from the source and one looking at the spring source. When back in the office, put digital files in [N:\Projects\para_springs\images](N:\Projects\para_springs\images).

Back in the office

When back in the office from the field, download and record your rover files. Merge and update new data with [N:\Projects\para_springs\work\springs_2005](#) and [N:\Projects\para_springs\work\incorrect_locations](#). Download photos from digital camera as well.

Results

Between February and April 2005, we visited 44 different locations. Twenty-nine of these were incorrect locations, and 15 were verified as springs. We visited Gyp, Burro (BLM), Burro (NPS), Buckhorn, Whiskey, Grapevine, Little Arizona, Black Willow, Ed's, Tassi and Pakoon Springs, as well as four previously unnamed springs. We designated these springs as Grand Wash Bay Seep, Chill Heal 1, A & M Spring and Grand Gulch Spring. Although we visited Tassi and Pakoon, they are not absolutely accurate as we are unsure about the origins of these springs.

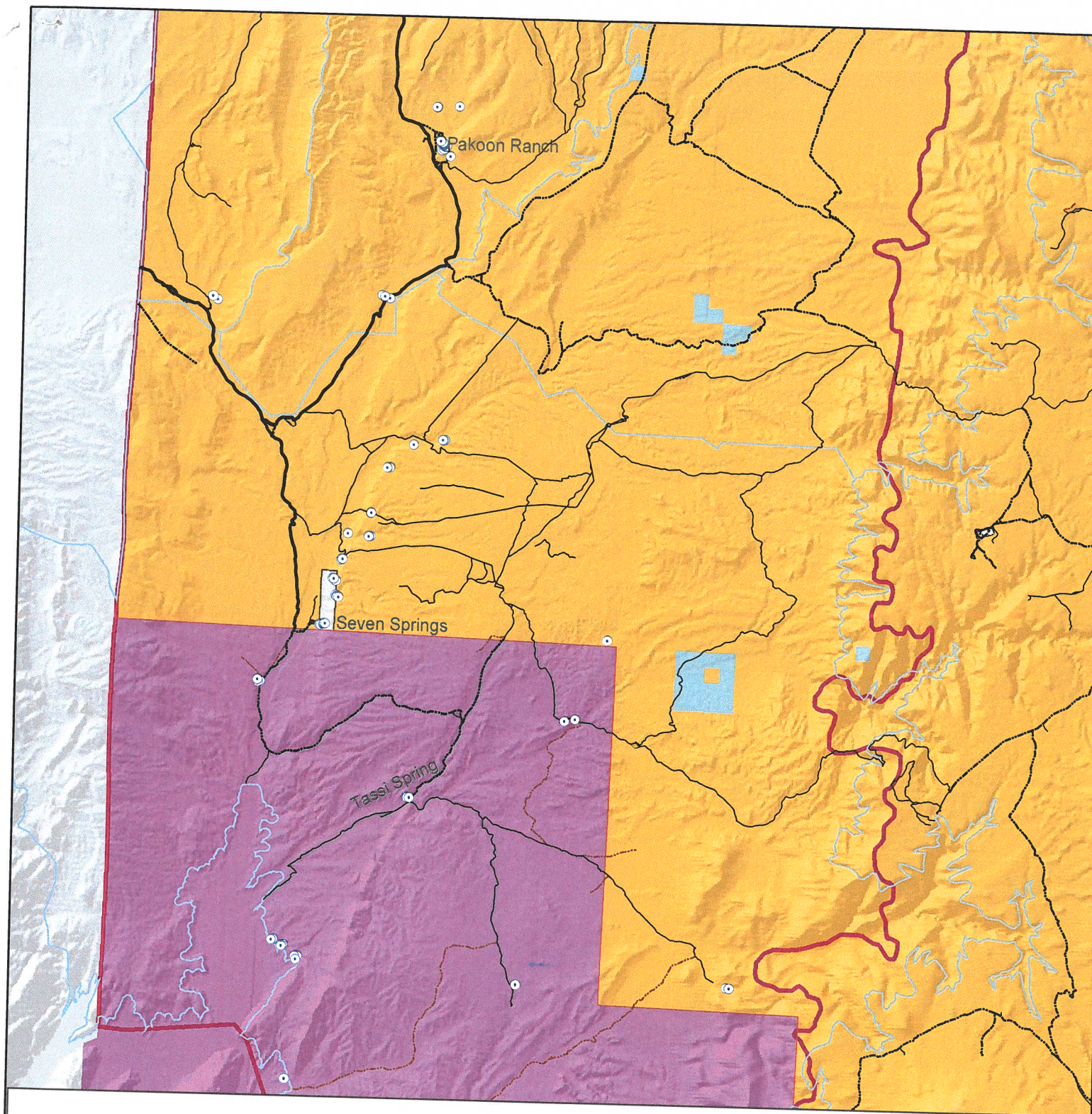
In general, the springs looked very good. Almost all of the springs were flowing very strong and there was abundant vegetation surrounding the riparian areas, although this could be partially related to the wet weather we've experienced this year. Ed's Spring, Burro Spring (BLM), Gyp Spring, and Black Willow Spring were all found to be dry.

Next Steps

The next steps for the Spring Inventory include:

1. Compiling databases for rest of Monument, and eventually Strip
2. Setting-up hot links with photos
3. Inspecting aerial photographs to identify other springs
4. Re-visiting Chill Heal
5. Taking photographs of Grapevine, Whiskey, and Buckhorn
6. Organizing hydrological study on Pakoon, Tassi and Seven Springs.

[illegible]



Unverified Springs - January 2005

- | | | |
|-----------------------|------------------------------|----------------------------------|
| ○ Unverified Springs | — Primary Road Unpaved | ■ Bureau of Land Management |
| □ Pakoon Basin | - - - Secondary Road Unpaved | ■ National Recreation Area (NPS) |
| □ Grazing Allotments | — Tertiary Road Unpaved | □ Private |
| □ Management Boundary | - - - Closed Road | ■ State |

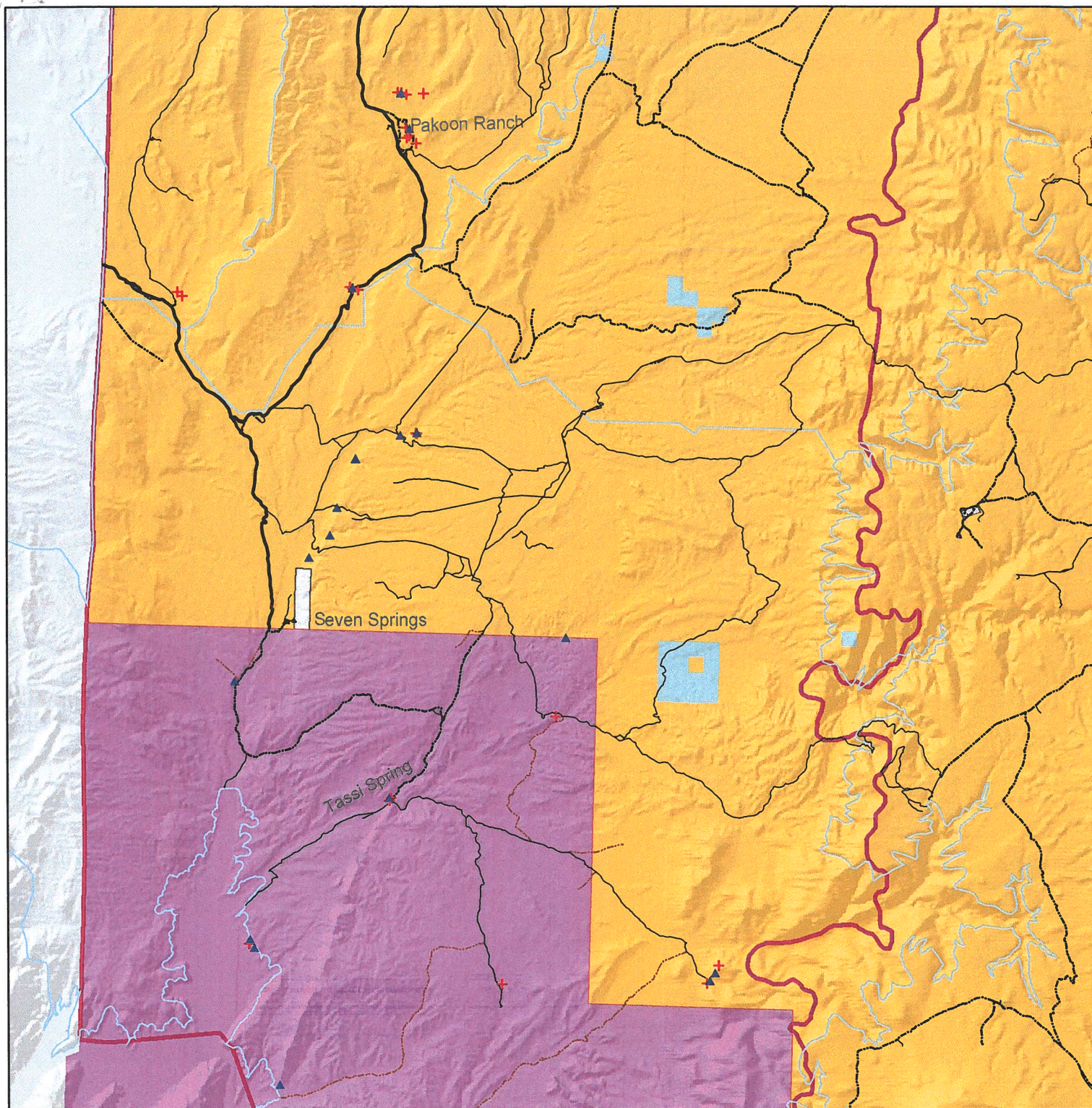


1 0 1 2 Miles

Scale 1:145,000



11 April 2005



Visited Locations - Spring 2005

- | | | |
|---------------------------------|------------------------------|---------------------------------------|
| ▲ Verified Springs | — Primary Road Unpaved | Yellow Bureau of Land Management |
| + Incorrect Locations | - - - Secondary Road Unpaved | Purple National Recreation Area (NPS) |
| Red Outline Pakoon Basin | — Tertiary Road Unpaved | White Private |
| Blue Outline Grazing Allotments | - - - Closed Road | Light Blue State |
| Red Outline Management Boundary | | |

1 0 1 2 Miles

Scale 1:145,000



11 April 2005

Rever: 021412A

Data Dictionary/Field Form for Spring Survey

4 January 2005

Unique ID #: S05-0001

Surveyor Name: Andrea Shortleaver UTMN: 4035095 UTME: 234,613

Spring Name: Ed's Spring Date of survey: Feb 14 2005

Source type: Rheocene Limnocene Helocene Qanat Well Unknown Other

Rock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic Other - in mud/dirt

Development: Developed Undeveloped Enclosure: Fenced Unfenced

Program: Range Wildlife Both Neither Pipeline: Yes No Unknown

Escape ramp installed: Yes No Not needed Covered: Yes No Not needed

Wildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair Maintain

Repairs needed: fence partially down, Spring is dry

Discharge: 0 l/min Spring brook length: 0

Depth: Depth 1 0 Depth 2 0 Depth 3 0 Width: Width 1 0 Width 2 0 Width 3 0

Water temperature: 0 °C Water pH: 0 Conductivity: 0 μmhos

Dissolved oxygen concentration: 0 mg/L Public accessibility: Category: 1 2 3 4 5

Substrate composition (%): Fines 50 Sand 50 Gravel ___ Cobble ___ Boulder ___ Bedrock ___

Percent cover of emergent vegetation: 10% Percent cover of vegetative bank cover: 60%

Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia Other

Tree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia Other

Non-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop Other

Non-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop Other

Spring Snails: Absent Rare Common Abundant

Other invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common Abundant

Amphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common Abundant

Birds: Absent Rare Common Abundant Mammals: Absent Rare Common Abundant

Site condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbed

Primary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/A

Notes: Spring dry, tree in 'spring' dead, located in wash, lots of grass around → recent wet weather
middle of area
✓ Take photo 2x
✓ Sketch on back

#1



Ed Spring Feb 14 2005

#2



Unique ID #: S05-0002

Surveyor Name: Andrew Shortskerev UTMN: _____ UTME: _____

Spring Name: Pakoon Spring Date of survey: Feb 14 2005

Source type: Rheocene Limnocene Helocene Qanat Well Unknown Other

Rock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic Other → Spring in tank

Development: Developed Undeveloped Enclosure: Fenced Unfenced

Program: Range Wildlife Both Neither Pipeline: Yes No Unknown

Escape ramp installed: Yes No Not needed Covered: Yes No Not needed

Wildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair Maintain

Repairs needed: Needs to be cleaned out

Discharge: _____ l/min Spring brook length: No brook ϕ

Depth: Depth 1 30+ Depth 2 30+ Depth 3 30+ Width: Width 1 _____ Width 2 _____ Width 3 _____
120cm diameter = .12m.

Water temperature: 30.6 °C Water pH: 7.42 Conductivity: 493 μ mhos

Dissolved oxygen concentration: ϕ mg/L Public accessibility: Category: 1 2 3 4 5

Substrate composition (%): Fines 0 Sand 0 Gravel 0 Cobble 0 Boulder 0 Bedrock 0 No substrate!

Percent cover of emergent vegetation: 90% Percent cover of vegetative bank cover: ϕ

Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia Other

Tree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia Other

Non-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop Other

Non-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop Other

Spring Snails: Absent Rare Common Abundant

Other invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common Abundant

Amphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common Abundant

Birds: Absent Rare Common Abundant Mammals: Absent Rare Common Abundant

Site condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbed

Primary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/A

Notes: All water from spring sits in tank, piped/pooled from ground.

✓ Take photo
Sketch on back



PAKOON SPRING
FEB 14 2005

Unique ID #: S05-0003Surveyor Name: Andrea Shortleaves UTMN: 134243.27 UTME: 4016472.74Spring Name: TASSI Date of survey: 16 March 4 2005Source type: Rheocene Limnocene Helocene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair Maintain None

Repairs needed: _____

Discharge: 2.4m l/min Spring brook length: 100+ (couldn't follow it all the way)Depth: Depth 1 25cm Depth 2 15cm Depth 3 20cm Width: Width 1 17cm Width 2 18cm Width 3 19cmWater temperature: 26° °C Water pH: 8.8 Conductivity: _____ μmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 30 Sand 30 Gravel 30 Cobble 10 Boulder 0 Bedrock 0Percent cover of emergent vegetation: 45% Percent cover of vegetative bank cover: 85%Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia OtherTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia OtherNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
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Flooding Dredging N/ANotes: Not sure if this is correct → actual Spring may beTake photo ✓
Sketch on backelsewhere. We may have been measuring a broken pipe

TASSI March 4 2005



Unique ID #: S05-0004Surveyor Name: Andrea Shortleaver UTMN: 235009.47 UTME: 4026116.27Spring Name: Black Willow Date of survey: 2 March 11 2005Source type: Rheocene Limnocene Helocene Qanat Well Unknown Other seepRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair MaintainRepairs needed: Well is filled in, pipe is brokenDischarge: 0 l/min Spring brook length: 0Depth: Depth 1 0 Depth 2 0 Depth 3 0 Width: Width 1 0 Width 2 0 Width 3 0Water temperature: 0 °C Water pH: 0 Conductivity: _____ μmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 90 Sand 0 Gravel 0 Cobble 0 Boulder 10 Bedrock 0Percent cover of emergent vegetation: 45 Percent cover of vegetative bank cover: 45Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia Other NoneTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia Other NoneNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
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Flooding Dredging N/ANotes: V. small seep - development no longer functioning, needs to be rebuilt & pumped outTake photo ☒
Sketch on back

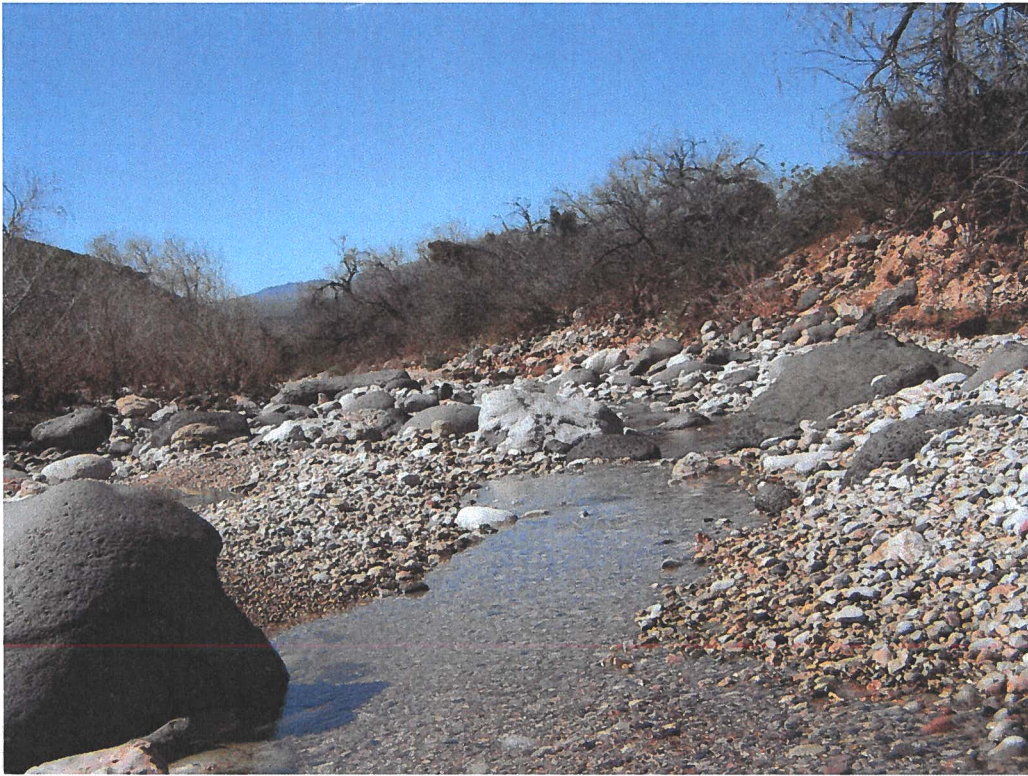
Black Willow
March 11 2005



Unique ID #: S05-0005Surveyor Name: Andrea Shortsiere UTMN: 234570.90 UTME: 4026050.68Spring Name: Grand Gulch spring (?) Date of survey: 2005 March 11Source type: Rheocene Limnocene Helocene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair Maintain None

Repairs needed: _____

Discharge: 12 l/min Spring brook length: .25 mileDepth: Depth 1 11cm Depth 2 8 Depth 3 18 Width: Width 1 39 inches Width 2 60 inches Width 3 14 inchesWater temperature: 21 °C Water pH: 6.5 Conductivity: _____ μmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 10 Sand 10 Gravel 40 Cobble 30 Boulder 10 Bedrock 0Percent cover of emergent vegetation: 0 Percent cover of vegetative bank cover: 0Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia Other NoneTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia Other NoneNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
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Flooding Dredging N/ANotes: Comes out of Wash, may not be permanentTake photo ☒
Sketch on back



grand gulch spring
March 11 2005

Data Dictionary/Field Form for Spring Survey

JDR: 014802

4 January 2005

Unique ID #: S05-0006Spring
Surveyor Name: Little Arizona UTMN: 233390.24 UTME: 4025440.54Surveyor
Spring Name: Andrea Shartskeure Date of survey: March 11 2005Source type: Rheocene Limnocene Helocene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair MaintainRepairs needed: Fence down, very overgrown → pipes found in wasDischarge: 12 l/min Spring brook length: 15 pacesDepth: Depth 1 20 cm Depth 2 20 cm Depth 3 20 cm Width: Width 1 30 cm Width 2 30 cm Width 3 30 cmWater temperature: 20 °C Water pH: 6.5 Conductivity: _____ μmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 20 Sand 20 Gravel 30 Cobble 20 Boulder 10 Bedrock _____Percent cover of emergent vegetation: 90 Percent cover of vegetative bank cover: 90Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia OtherTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia OtherNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
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Flooding Dredging N/A mesquiteNotes: Couldn't get to head of Spring as it was too overg
water covered w/ green algaeTake photo ☒
Sketch on back



Little Arizona
March 11 2005



Side views
of enclosure



Unique ID #: S05-0007Surveyor Name: Andrew Shortleave UTMN: _____ UTME: _____Spring Name: Burn Spring (BLM) Date of survey: Feb 22 2005Source type: Rheocene Limnocene Helocene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair MaintainRepairs needed: Spring is Dry, trough filled in w/ dirtDischarge: 0 l/min Spring brook length: 0Depth: Depth 1 0 Depth 2 0 Depth 3 0 Width: Width 1 0 Width 2 0 Width 3 0Water temperature: 0 °C Water pH: 0 Conductivity: _____ μmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 20 Sand 30 Gravel 30 Cobble 20 Boulder _____ Bedrock _____Percent cover of emergent vegetation: 70 Percent cover of vegetative bank cover: 70Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia OtherTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia OtherNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherSpring Snails: Absent Rare Common AbundantOther invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common AbundantAmphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common AbundantBirds: Absent Rare Common Abundant Mammals: Absent Rare Common AbundantSite condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbedPrimary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/ANotes: Spring dry, next to wash, fence in good shapeTake photo
Sketch on back

Data Dictionary/Field Form for Spring Survey

JDR: 014519
4 January 2005Unique ID #: S05-0008Surveyor Name: Andrea Shortleaver UTMN: 4024140.7 UTME: 232896.7Spring Name: Grapevine Date of survey: March 18 2005Source type: Rheocene Limnocene Melocene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair MaintainRepairs needed: Overgrown with CattailsDischarge: 15 l/min Spring brook length: 100+ pacesDepth: Depth 1 9cm Depth 2 8cm Depth 3 12cm Width: Width 1 48"m Width 2 36"m Width 3 18"mWater temperature: 17 °C Water pH: 7.3 Conductivity: 94 μmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 0 Sand 30 Gravel 0 Cobble 40 Boulder 30 Bedrock 0Percent cover of emergent vegetation: 60 Percent cover of vegetative bank cover: 90Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia OtherTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia OtherNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed Cattail
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherSpring Snails: Absent Rare Common AbundantOther invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common AbundantAmphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common AbundantBirds: Absent Rare Common Abundant Mammals: Absent Rare Common AbundantSite condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbedPrimary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/A + CattailsNotes: Overgrown

Take photo

Sketch on back

Data Dictionary/Field Form for Spring Survey

JDR: 014956
4 January 2005Unique ID #: S05-0009Surveyor Name: Andrea Shattuck UTMN: 4023416 UTME: 232704Spring Name: Buckhorn Spring Date of survey: March 18 2005Source type: Rheocrene Limnocrene Helocrene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair MaintainRepairs needed: looks goodDischarge: 4 l/min Spring brook length: 100'Depth: Depth 1 2cm Depth 2 1cm Depth 3 2cm Width: Width 1 16" Width 2 36" Width 3 28"Water temperature: 16 °C Water pH: 7.5 Conductivity: 112 μmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 40 Sand 20 Gravel 30 Cobble 10 Boulder 0 Bedrock 0Percent cover of emergent vegetation: 50 Percent cover of vegetative bank cover: 80Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia OtherTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia OtherNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherSpring Snails: Absent Rare Common AbundantOther invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common AbundantAmphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common AbundantBirds: Absent Rare Common Abundant Mammals: Absent Rare Common AbundantSite condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbedPrimary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/ANotes: OvergrownTake photo
Sketch on back

Data Dictionary/Field Form for Spring Survey

JDR: 014957
4 January 2005Unique ID #: S05-0010Surveyor Name: Andrea Shortzener UTMN: 4022832.4 UTME: 232156.2Spring Name: Whiskey Date of survey: March 18 2005Source type: Rheocene Limnocene Helocene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair MaintainRepairs needed: lots of cattailDischarge: 15 l/min Spring brook length: 100+Depth: Depth 1 3cm Depth 2 10cm Depth 3 1cm Width: Width 1 12 in Width 2 9 inch Width 3 18 inchesWater temperature: 20 °C Water pH: 7.6 Conductivity: 93 µmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 50 Sand 40 Gravel 0 Cobble 0 Boulder 10 Bedrock 0Percent cover of emergent vegetation: 75 Percent cover of vegetative bank cover: 80Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia OtherTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia OtherNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop Other CattailSpring Snails: Absent Rare Common AbundantOther invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common AbundantAmphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common AbundantBirds: Absent Rare Common Abundant Mammals: Absent Rare Common AbundantSite condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbedPrimary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/A Cattails

Notes: _____

Take photo
Sketch on back

4 January 2005

Unique ID #: S05-0011

Unique ID #: 305-001
 Surveyor Name: Kyle Voyles, ^{Andrea Shortsteele} UTMN: 4019562.39 UTME: 236173.46

Spring Name: Burns South Date of survey: March 22 2005

Source type: Rheocene Limnocene Helocene Qanat Well Unknown Other

Rock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic Other

Development: Developed ☒ Undeveloped ☐ **Enclosure:** Fenced ☒ Unfenced ☐

Program: Range Wildlife Both Neither **Pipeline:** Yes No Unknown

Escape ramp installed: Yes No Not needed **Covered:** Yes No Not needed

Wildlife accessibility: Accessible ☒ Inaccessible ☐ **Condition:** Abandoned ☐ Rebuild ☐ Repair ☐ Maintain ☒ None ☐

Repairs needed:

Discharge: _____ l/min **Spring brook length:** 40 paces

Depth: Depth 1 2 cm Depth 2 1 cm Depth 3 1.5 cm **Width:** Width 1 6 ft Width 2 3 ft Width 3 3 ft

Water temperature: 18 °C Water pH: 6.95 Conductivity: 625 μmhos

Dissolved oxygen concentration: _____mg/L **Public accessibility:** Category: 1 2 3 4 (5)

Substrate composition (%): Fines 10 Sand 10 Gravel 60 Cobble 10 Boulder 10 Bedrock 0

Percent cover of emergent vegetation: 80% Percent cover of vegetative bank cover: 90%

Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia Other

Tree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia Other

Non-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop Other

Non-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop Other

Spring Snails: Absent Rare Common Abundant

Other invertebrates: Absent Rare Common Abundant **Fish:** Absent Rare Common Abundant

Amphibians: Absent Rare Common Abundant **Reptiles:** Absent Rare Common Abundant

Birds: Absent Rare Common Abundant **Mammals:** Absent Rare Common Abundant

Site condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbed

Primary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/A

Notes: lots of grass

Take photo
Sketch on back



Buho
NPS



Data Dictionary/Field Form for Spring Survey

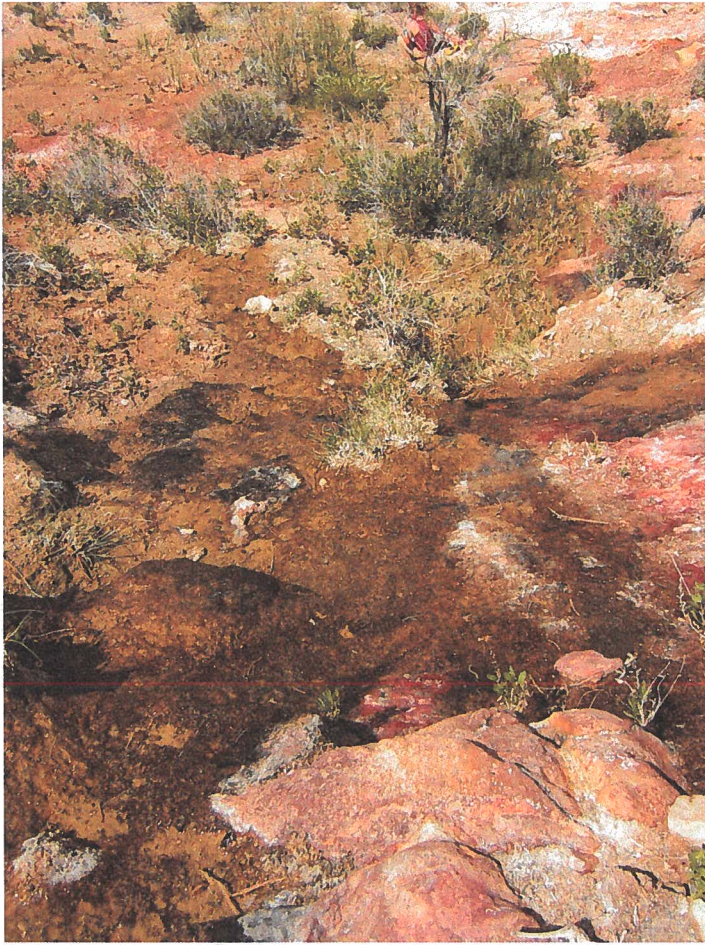
JDR: 010791
4 January 2005Unique ID #: SO5-0012Surveyor Name: Andrew Shortleeve UTMN: _____ UTME: _____Spring Name: Gyp Spring Date of survey: March 31 2005Source type: Rheocene Limnocene Helocene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair MaintainRepairs needed: Project has been abandoned; Spring dryDischarge: 0 l/min Spring brook length: 0Depth: Depth 1 0 Depth 2 _____ Depth 3 _____ Width: Width 1 0 Width 2 _____ Width 3 _____Water temperature: 0 °C Water pH: 0 Conductivity: 0 μmhosDissolved oxygen concentration: 0 mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 0 Sand 0 Gravel 0 Cobble 0 Boulder 0 Bedrock 0Percent cover of emergent vegetation: 0 Percent cover of vegetative bank cover: 0Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia Other

Tree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia Other

Non-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherSpring Snails: Absent Rare Common AbundantOther invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common AbundantAmphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common AbundantBirds: Absent Rare Common Abundant Mammals: Absent Rare Common AbundantSite condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbedPrimary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/A RangeNotes: Spring dry - all that is left is a filled in troughTake photo
Sketch on back



Unique ID #: S05-0013Surveyor Name: Andrea Shott-Sleeve UTMN: _____ UTME: _____Spring Name: A & M Spring Date of survey: April 6, 2005Source type: Rheocrene Limnocrene Helocrene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair MaintainRepairs needed: Its fineDischarge: 1.5 l/min Spring brook length: 76 pacesDepth: Depth 1 5cm Depth 2 _____ Depth 3 _____ Width: Width 1 17 inches Width 2 _____ Width 3 _____Water temperature: 24 °C Water pH: 7.62 Conductivity: 2.24 μmhosDissolved oxygen concentration: 49.6 mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 60 Sand _____ Gravel _____ Cobble 10 Boulder _____ Bedrock 30Percent cover of emergent vegetation: 20 Percent cover of vegetative bank cover: 20Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia OtherTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia OtherNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherSpring Snails: Absent Rare Common AbundantOther invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common AbundantAmphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common AbundantBirds: Absent Rare Common Abundant Mammals: Absent Rare Common AbundantSite condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbedPrimary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/ANotes: lots of mineral deposits, Stream flowing downhill
burros spotted hereTake photo
Sketch on back



A+M Spring
April 6 2005



Unique ID #: S05-0014Surveyor Name: Andrew Shortleene *Kyle Vogles* UTMN: 4012 520 UTME: 230670Spring Name: Chill Heal Spring 1 Date of survey: March 29Source type: Rheocene Limnocene Helocene Qanat Well Unknown OtherRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair Maintain

Repairs needed: _____

Discharge: 15 l/min Spring brook length: 400Depth: Depth 1 1 cm Depth 2 _____ Depth 3 _____ Width: Width 1 13 cm Width 2 _____ Width 3 _____Water temperature: 21 °C Water pH: 7.5 Conductivity: _____ μmhosDissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 10 Sand 10 Gravel 40 Cobble 10 Boulder _____ Bedrock 30Percent cover of emergent vegetation: 90 Percent cover of vegetative bank cover: 100Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia Other

Tree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia Other

Non-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherSpring Snails: Absent Rare Common AbundantOther invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common AbundantAmphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common AbundantBirds: Absent Rare Common Abundant Mammals: Absent Rare Common AbundantSite condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbedPrimary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/ANotes: long w/ several startsTake photo 2
Sketch on back*Cattail
Musk Thistle*



Unique ID #: S05-0015Surveyor Name: Andrea Shortleaves & Kyle Voyles UTMN: _____ UTME: _____Spring Name: Grand Wash Bay Seep Date of survey: March 29Source type: Rheocene Limnocene Helocene Qanat Well Unknown Other SeepRock Type: Basalt Gneiss Limestone Sandstone Mudstone Shale Alluvial/Colluvial Conglomerate
Other Volcanic OtherDevelopment: Developed Undeveloped Enclosure: Fenced UnfencedProgram: Range Wildlife Both Neither Pipeline: Yes No UnknownEscape ramp installed: Yes No Not needed Covered: Yes No Not neededWildlife accessibility: Accessible Inaccessible Condition: Abandoned Rebuild Repair Maintain

Repairs needed: _____

Discharge: 0 l/min Spring brook length: 8 pacesDepth: Depth 1 0 Depth 2 0 Depth 3 0 Width: Width 1 4 ft Width 2 _____ Width 3 _____

Water temperature: _____ °C Water pH: _____ Conductivity: _____ μmhos

Dissolved oxygen concentration: _____ mg/L Public accessibility: Category: 1 2 3 4 5Substrate composition (%): Fines 0 Sand _____ Gravel _____ Cobble _____ Boulder 10 Bedrock 10Percent cover of emergent vegetation: 100 Percent cover of vegetative bank cover: 100Tree/Woody vegetation 1: Willow Cottonwood Mesquite Acacia OtherTree/Woody vegetation 2: Willow Cottonwood Mesquite Acacia OtherNon-native species 1: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherNon-native species 2: Camelthorn Halogeton Hoary Cress Malta Star Thistle Morning Glory Russian Knapweed
Russian Olive Salt Cedar Scotch Thistle Silverleaf Nightshade Spotted Knapweed Squarros Knapweed Tall Whitetop OtherSpring Snails: Absent Rare Common AbundantOther invertebrates: Absent Rare Common Abundant Fish: Absent Rare Common AbundantAmphibians: Absent Rare Common Abundant Reptiles: Absent Rare Common AbundantBirds: Absent Rare Common Abundant Mammals: Absent Rare Common AbundantSite condition: Undisturbed Slightly disturbed Moderately disturbed Highly disturbedPrimary disturbance cause: Non-native animals Diversion Recreation Residence Drying Fire
Flooding Dredging N/ANotes: Marshy - seep area, NO flowing waterTake photo 0124Sketch on back X

