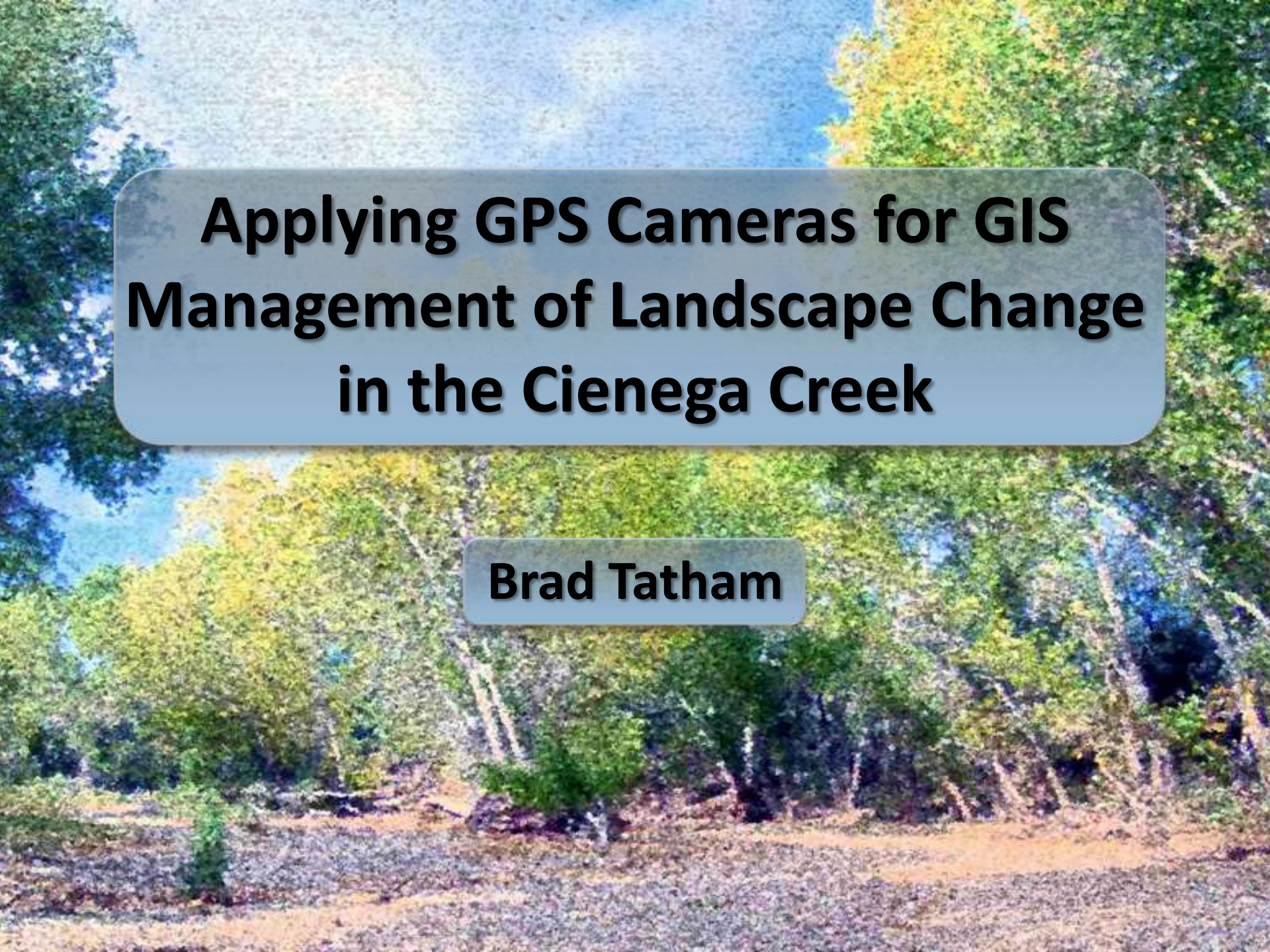


Applying GPS Cameras for GIS Management of Landscape Change in the Cienega Creek

Brad Tatham

Outline

- Using Cameras to Record Landscape Change
- Recording Locations using GPS
- Cienega Preserve Project

Presenter

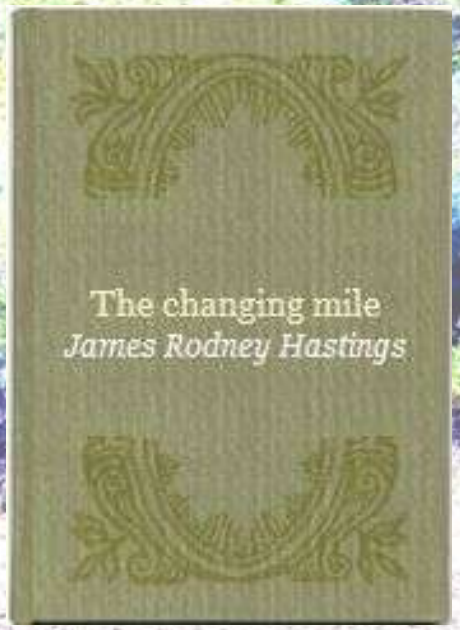
- **Brad Tatham**
  - **Landscape Architecture**
  - **Photography**
  - **GIS/GPS**

History

- Recording the American Landscape through Paintings (Hudson River School)
- Photographing Western landscapes 1850's on

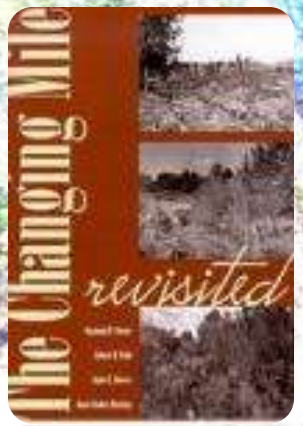
The Changing Mile

- Location: Southern Arizona
- Find Location of Historical Photographs
- Replicate the photography (1960s)
- Review the landscape change



Modern Applications

- River Flow change – A citizen project
- The Changing Mile revisited
- Las Cienegas NCA – BLM
- Invasive Species



Cienega Preserve Location

Cienega Preserve

- Pima County Preserve
- Permit required for entry
- Identified as 1 of 3 important Water Sources (purity)

Las Cienegas NCA (BLM)

- Using photography and GPS
- Camera at set GPS points
- 10+ Points

Project Parameters

- GIS Photography on the Fly
  - More Points
  - Photograph the Landscape
  - Record Surface Water
  - Record Invasive Species
- 5 meter accuracy

Equipment

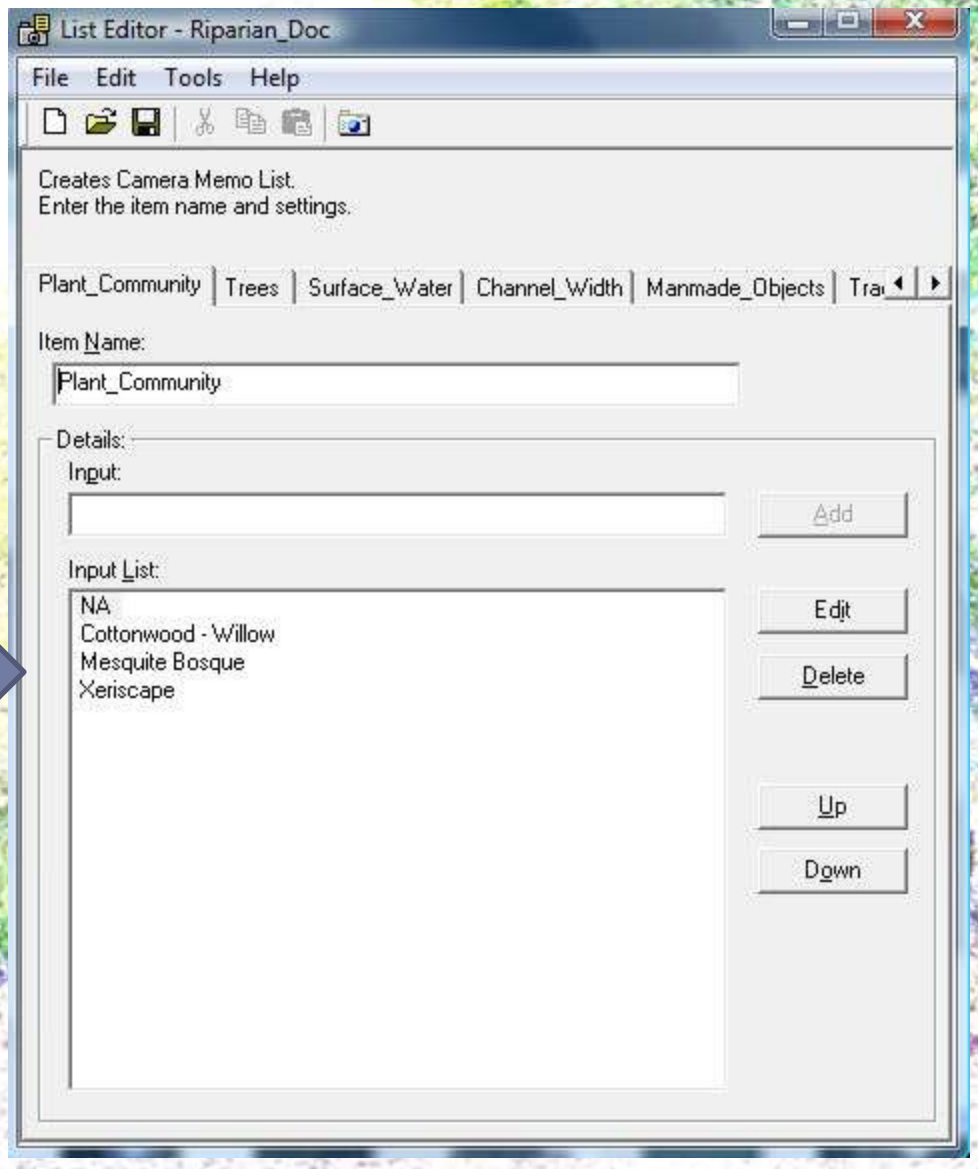
- Hat
- Water
- Flashlight
- Verizon cell (on hills)
- Food
- ….

Equipment

- Ricoh SE-500 SE2c
  - Landscape
    - Photograph
  - Datalogger
    - Invasive Plant recorded
    - Surface Water recorded
  - GPS
    - Location
  - Compass
    - Direction of Photograph
- GPS unit/ArcPAD with imagery *recommended*

Data Picker

- Datalogger
  - Invasive Plant
  - Surface Water



Data Picker

Plant_Community | Trees

Item Name:

Trees

Details:

Input:

Input List:

TAAP
PRVE

Plant_Community | Trees | Surface_Water

Item Name:

Surface_Water

Details:

Input:

Input List:

NA
Not Present
Present

Data Picker

Item Name:

Channel_Width

Details:

Input:

Input List:

1
2
3
4
5
6
7
8
9
10
12
14
16
18
20

Item Name:

Manmade_Objects

Details:

Input:

Input List:

Pipe
Wire
Campsite

Item Name:

Tracks

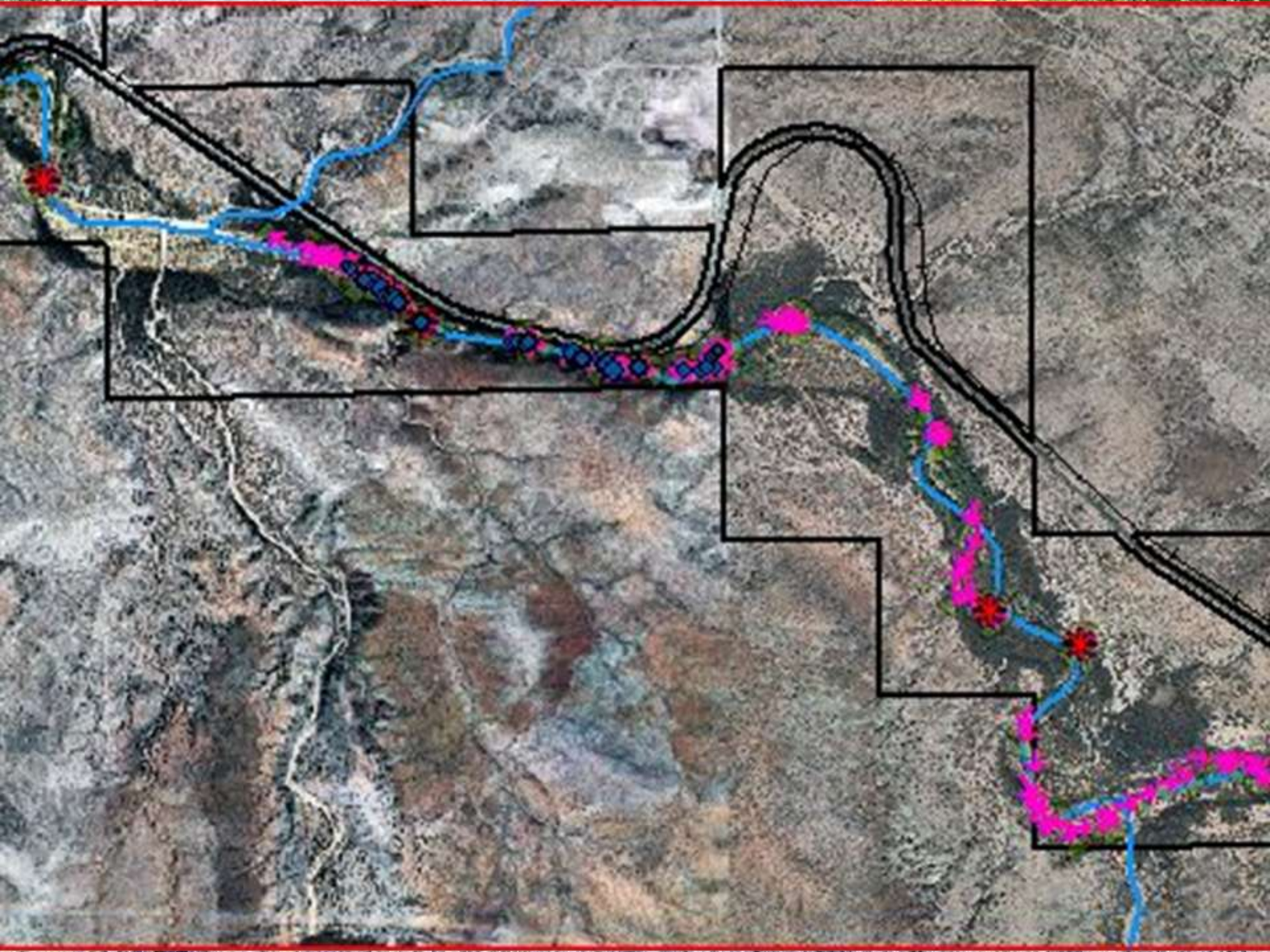
Details:

Input:

Input List:

Tire
Deer
Javalina
Cows

Cienega Preserve Location

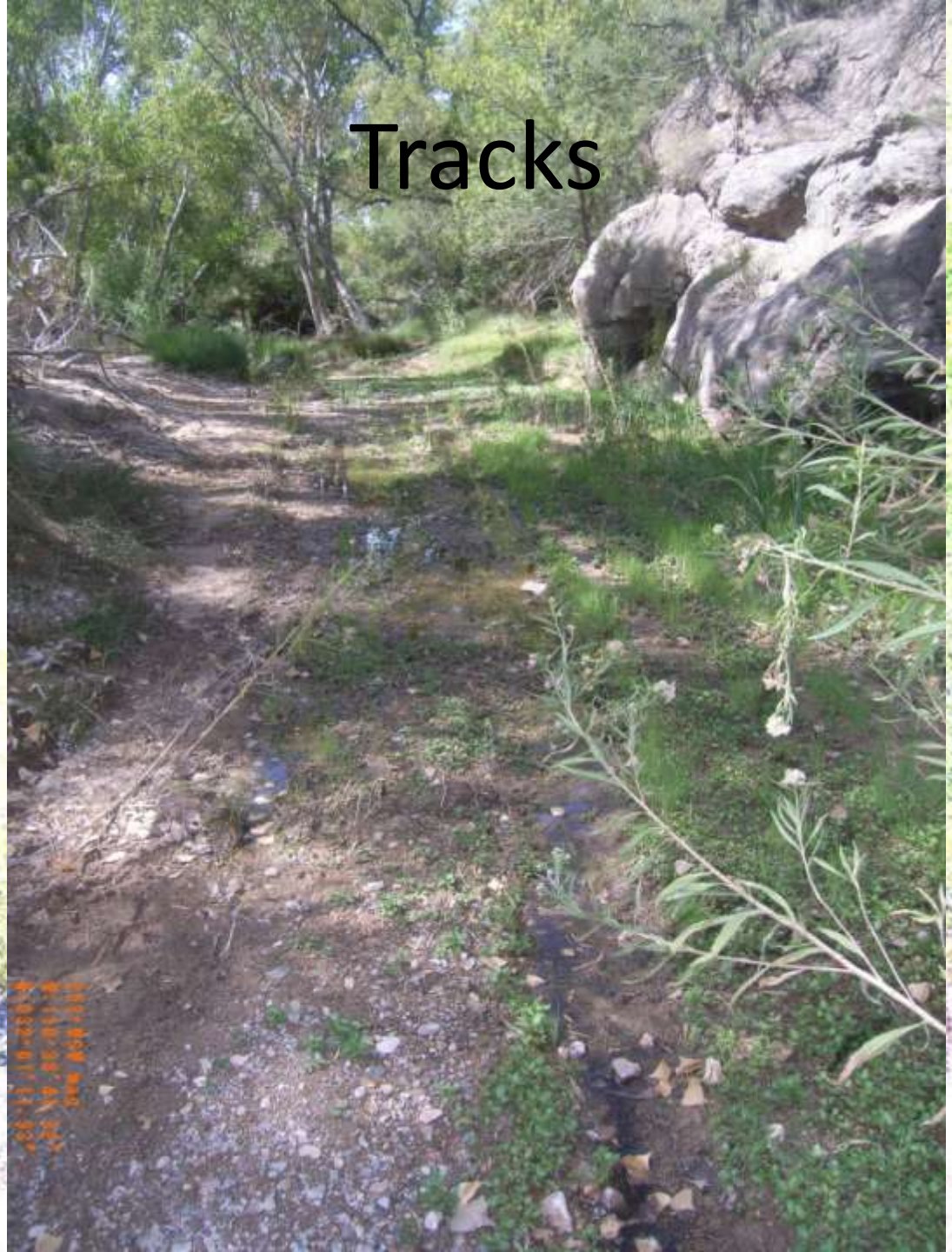


No Surface Water
Water
Wate

Tamarisk

1040SSB MAG
W110°27'45.85"
N32°00'40.08"

Tracks

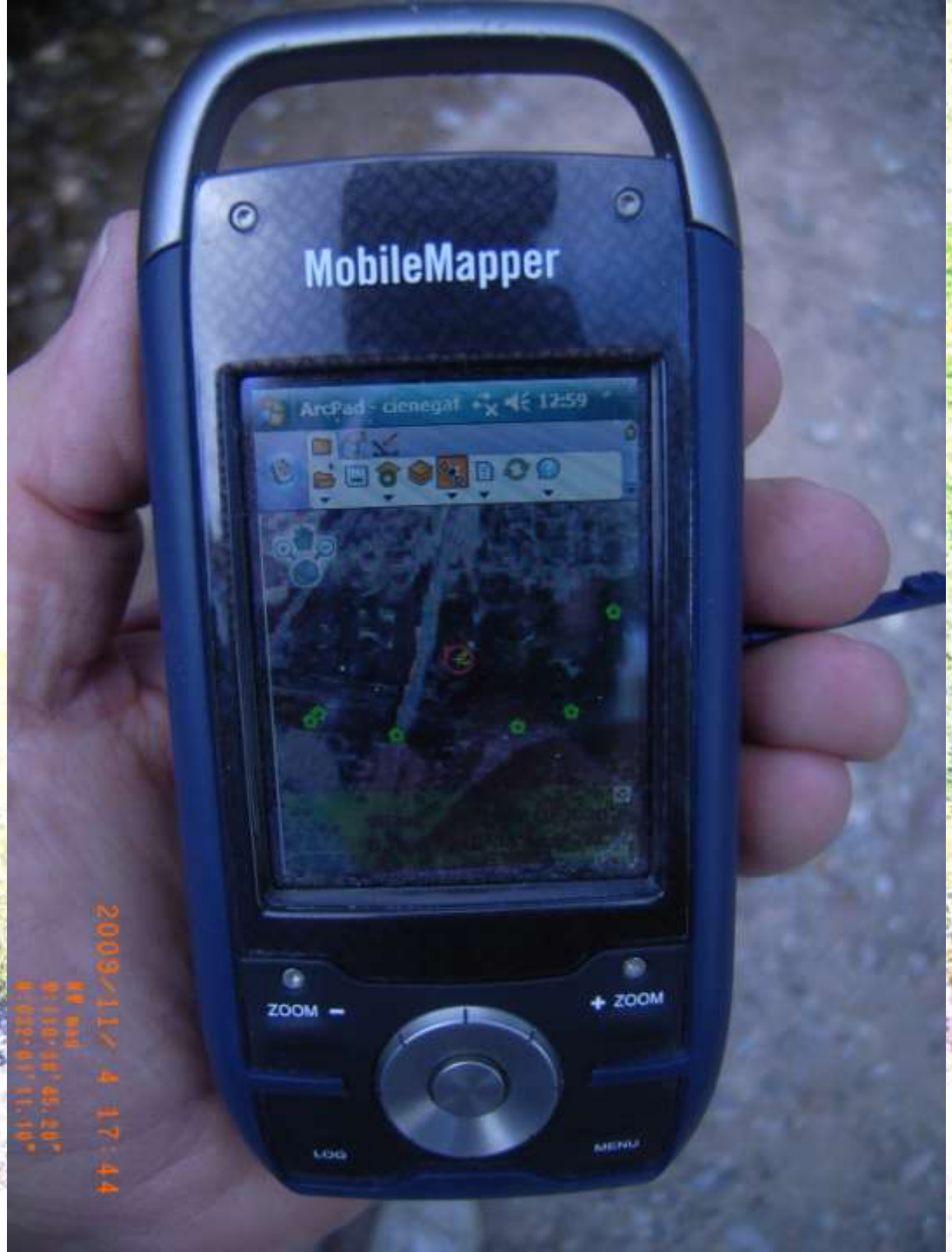


Return Trip Equipment

- Ricoh SE-500 SE2c
- GPS Unit
- MobileMapper 6
  - ArcPAD 8
    - Imagery
    - Photo points

Return Trip Equipment

- Re-photographing the Landscape


MobileMapper
ArcPad - cienegal
12:59
ZOOM −
+ ZOOM
LOG
MENU
2009/11/ 4 17:44

ArcPad - cienegafin 1:00

2009-10-13shp.shp

Property	Value
LON	-110.64579722
LAT	32.01968889
EAST	<Null>
NORTH	<Null>
ZONE	<Null>
ALTITUDE	3270.997
DIRECTION	284.0
HEADING	284
DATUM	Lat / Lon WGS 84
PHOTONUM	12
TITLE	<Null>

Attributes | Picture | Symbol

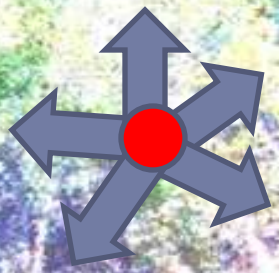
2009/11/4 17:45

E:-110°38'44.95"
N:032°01'10.82"

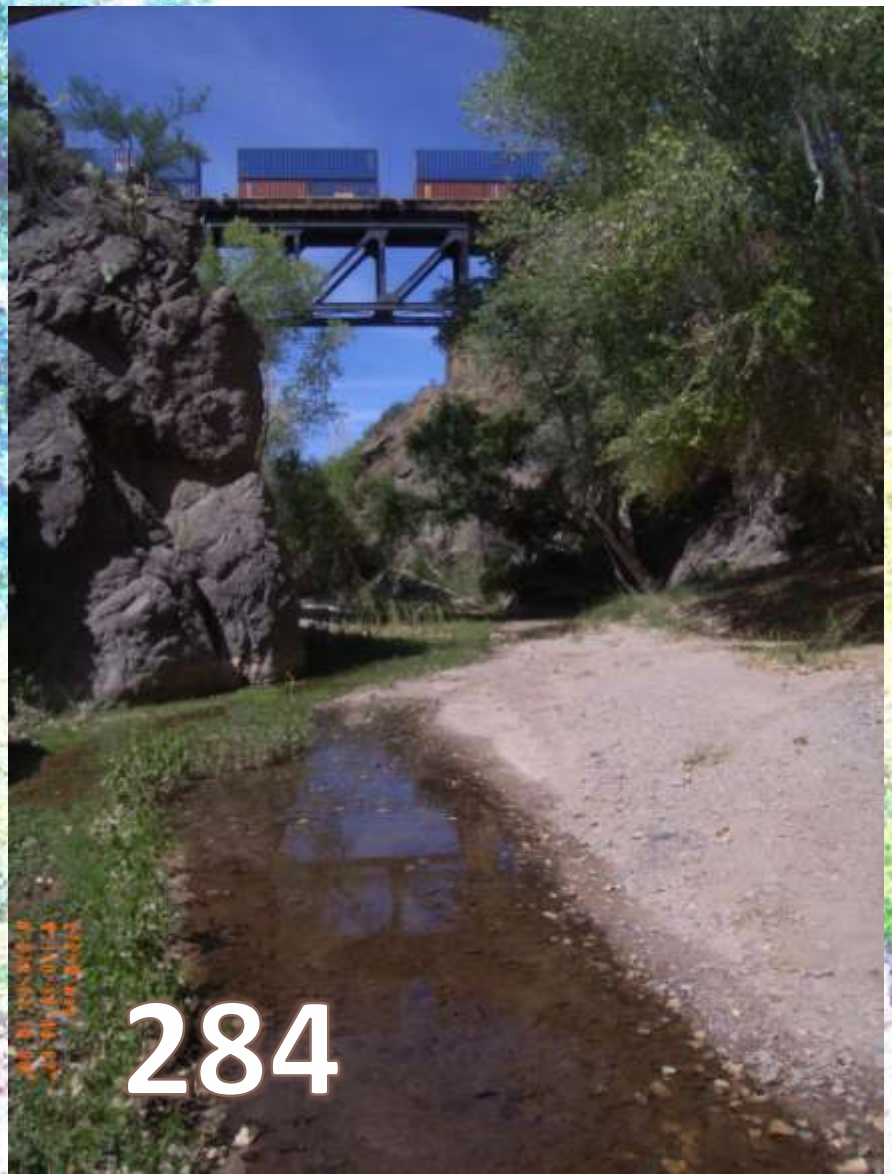
Panorama Photo Issues

Selected Attributes of Cienega091002_Survey

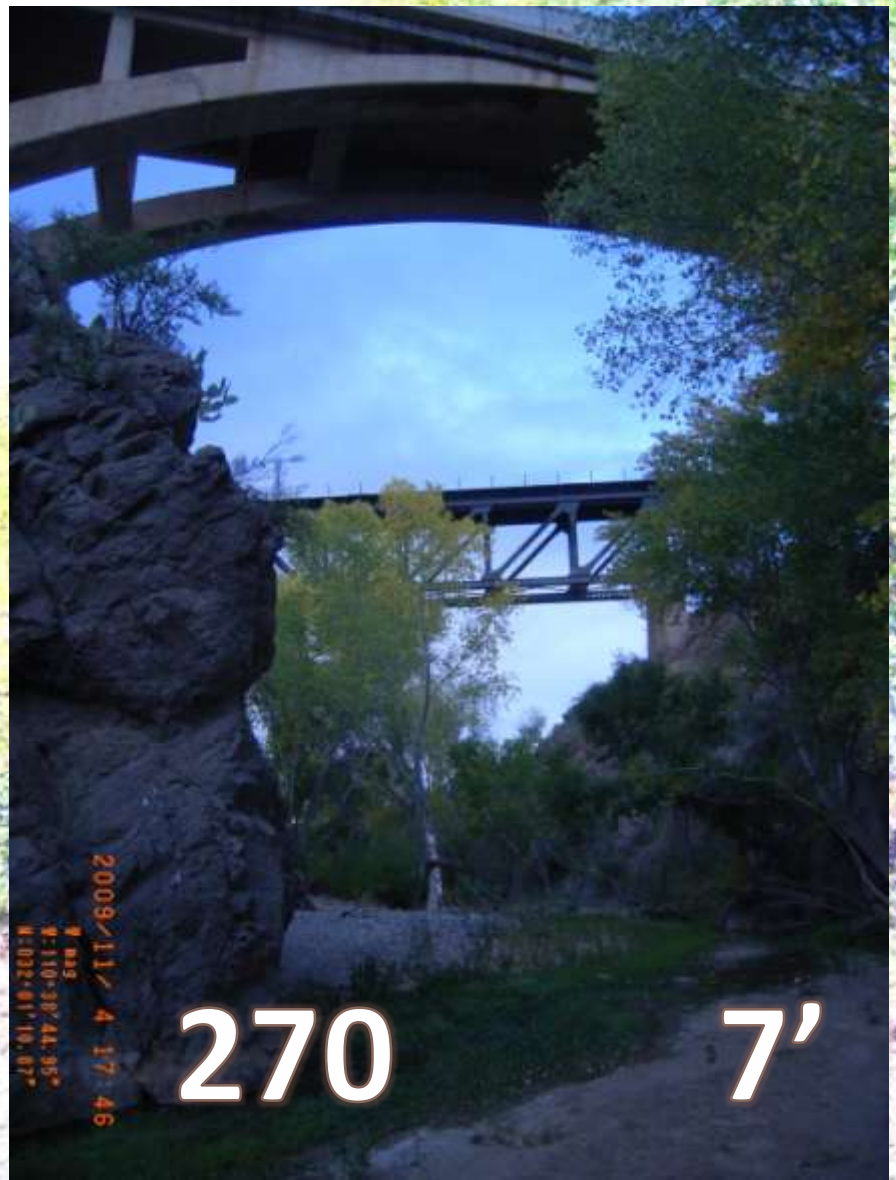
LON	LAT	ALTITUDE	DIRECTION	HEADING	DATUM	PHOTONUM	TITLE	SUBTITLE	COMMENT	ORIGINAL
-110.645797	32.019689	3270.997	72.6	72.6	Lat / Lon WGS 84	14			Cottonwood_Willow	R0010290.JPG
-110.645797	32.019689	3270.997	54.4	54.4	Lat / Lon WGS 84	15			Cottonwood_Willow	R0010291.JPG
-110.645797	32.019689	3270.997	64.2	64.2	Lat / Lon WGS 84	16			Cottonwood_Willow	R0010292.JPG
-110.645797	32.019689	3270.997	98.7	98.7	Lat / Lon WGS 84	17			Cottonwood_Willow	R0010293.JPG
-110.645797	32.019689	3270.997	72.1	72.1	Lat / Lon WGS 84	18			Cottonwood_Willow	R0010294.JPG
-110.645797	32.019689	3270.997	241.1	241.1	Lat / Lon WGS 84	19			Cottonwood_Willow	R0010295.JPG
-110.645797	32.019689	3270.997	187.8	187.8	Lat / Lon WGS 84	20			Cottonwood_Willow	R0010296.JPG
-110.645797	32.019689	3270.997	243.1	243.1	Lat / Lon WGS 84	21			Cottonwood_Willow	R0010297.JPG
-110.645797	32.019689	3270.997	284.0	284	Lat / Lon WGS 84	12			Cottonwood_Willow	R0010288.JPG
-110.645797	32.019689	3270.997	99.1	99.1	Lat / Lon WGS 84	13			Cottonwood_Willow	R0010289.JPG



October

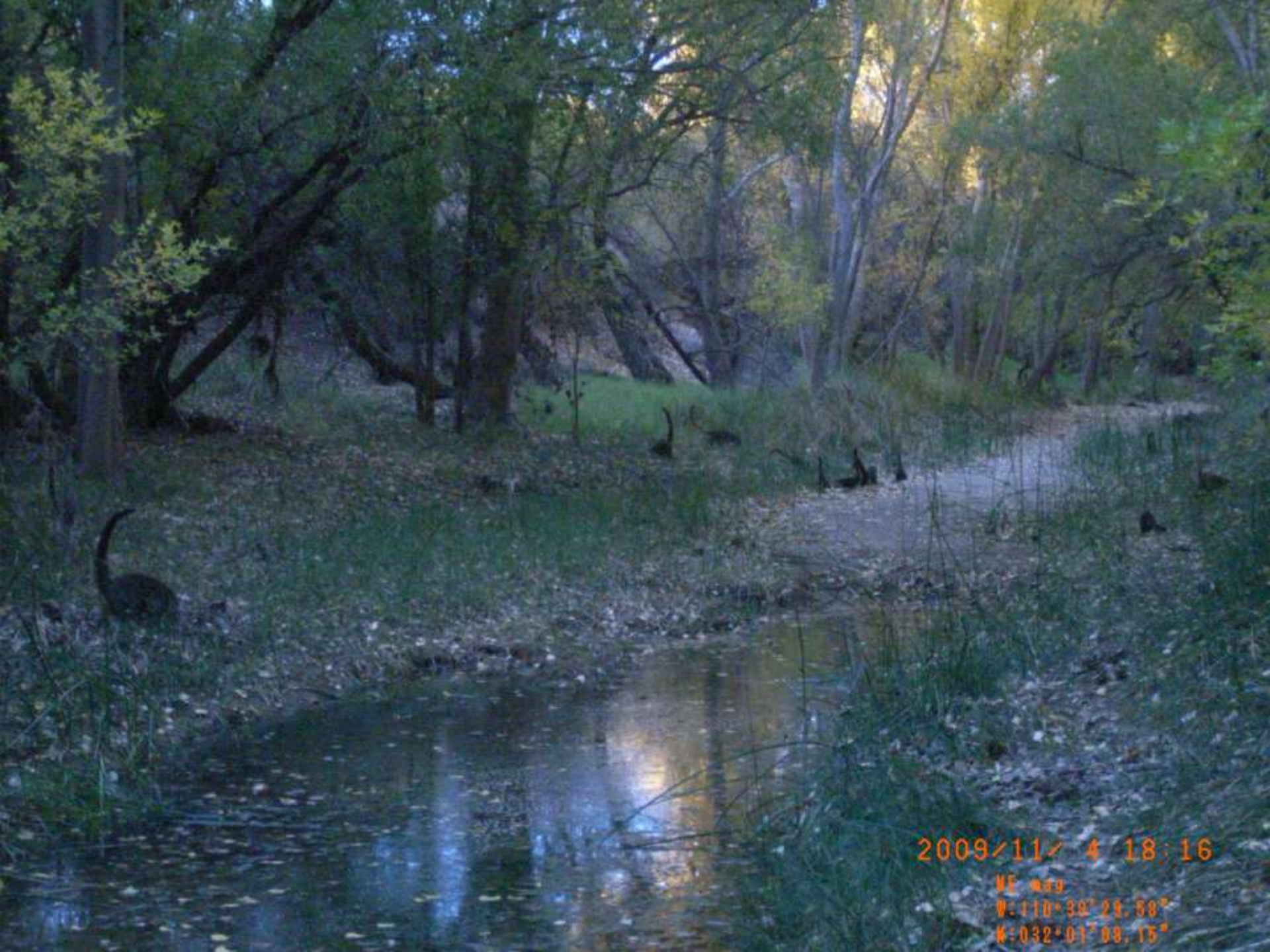


November



Lessons Learned

- Time
  - Start Early (Area traveled/daylight)
  - Use GPS on first trip
  - Panoramic Photographs as attribute value
  - Get back to the point by walking in a curve
  - Replicating Heading
  - Strap on camera too short for my vision
  - 2 to 5 Meter X 2 (for future generations)
  - Add photographs on GPS unit


2009/11/ 4 18:16
W:110°38'29.58"
N:032°01'08.15"

The Beginning

- **Brad Tatham**
- **gistrianer@gmail.com**
- **520-971-7624**