

**ALLOTMENT MANAGEMENT PLAN  
FOR THE  
WILLOW WASH ALLOTMENT  
BLACK MESA RANGER DISTRICT  
APACHE - SITGREAVES NATIONAL FORESTS**

PERMITTEE NAME *J.D.S. Roberts* *John D. Roberts* DATE: *MAY. 14 02*

PERMITTEE NAME *J. Williams* *John Williams* DATE: *MAY 14 02*

DISTRICT RANGER *Kate Klein* DATE: *5/14/02*

*Donna Williams* *4/8/2013*

*clj* *4/9/2013*

## **I. INTRODUCTION**

The Willow Wash Allotment consist of 42,053 acres and is located eight miles east of Heber, Arizona within portions of Townships 10 through 13N and Ranges 18 and 19E, Gila and Salt River Meridian (G&SRM), Arizona. Elevations range from 6,000 feet in the North to near 7,250 feet in the southern part of the allotment. The terrain is relatively gentle and sloping. Ponderosa pine, pinyon/juniper and grasslands dominate the landscape.

The Sundown Allotment consist of 9,370 acres and is located six miles east of Heber, Arizona within portions of Township 12N and Range 18E, G&SRM, Arizona. Elevations range from 6,310 feet in the north to near 6,630 feet in the southern part of the allotment. The terrain is relatively gentle and sloping. Pinyon juniper dominates the landscape.

The Verde Allotment, which consists of 4,941 acres, is located east of Heber, Arizona within portions of Township 11 and 12N and Range 18E, G&SRM, Arizona. Elevations range from 6,630 feet in the north to 6,720 feet at the southern end of the allotment. The topography is gentle. Ponderosa Pine and pinyon-juniper forest are the major vegetation types in the allotment.

This allotment management plan (AMP) shall set forth the objectives, management requirements, improvements needed and monitoring and evaluation standards for the Willow Wash, Sundown and Verde Allotments as outlined in the Forest Plan and the Decision Notice for these allotments, signed by the District Ranger on March 2, 1999, and also portions of the treatments listed in the Decision Notice for the Sundown Ecosystem Management Area signed by the Forest Supervisor on March 3, 1997.

## **II. OBJECTIVES**

### **A. Vegetative Structural Stages (VSS)**

Objective is to move toward the following Pinyon-juniper VSS distributions within 15 years of the date of the AMP on the allotment (specific treatment areas are in the improvement section):

#### Desired

- VSS 1 = 10%
- VSS 2A = 10%
- VSS 2B = 5%
- VSS 3A = 10%
- VSS 3B = 5%
- VSS 4A = 20%
- VSS 4B = 10%
- VSS 4C = 10%
- VSS 5A = 10%
- VSS 5C = 10%

**Size classes:**

VSS 1 = 0 to 0.2 inches Diameter Root Crown (DRC)

VSS 2 = 0.2 to 3" DRC

VSS 3 = 3 to 9" DRC

VSS 4 = 9 to 12" DRC

VSS 5 = 12+" DRC

**Canopy Closure**

VSS 1 = 0%

A = 10 – 20%

B = 21 – 40%

C = 40+%

**B. Range Conditions**

- The long term goals for range conditions on the allotment in the pinyon-juniper woodland are 10% good, 80% fair and 10% or less in poor on full capacity range. Strive to achieve within 25 to 30 years after full implementation of this AMP.
- The short-term objective to meet the long-term goal is to strive to achieve a 10-15% increase in Fair range condition within 10 years after full implementation of this AMP.

**C. Browse**

- Browse stands are vigorous and well represented on suitable sites. These stands will be considered healthy when no decadence is apparent, plant vigor is indicated by long leader lengths and growth forms are consistent with natural conditions (e.g. browse not clubbed in appearance and trees are not dwarfed or exhibit shrub form). Objective is to achieve in 10 years after full implementation
- Browse should make up 5 to 15% of the total plant composition and of that percent, 45% should be "A" species and 35% should be "B" species (A, B and C species are specified in 1982 Allotment Analysis Handbook "Species Classification list for trees and shrubs"). Strive to achieve within 25 to 30 yrs after full implementation.
- Increase browse density by 20% above current levels. Strive to achieve with 25 to 30 yrs after full implementation.

**D. Watershed and Soils**

- In woodland stands where the canopy cover is <20%, there is a 60% ground cover, comprised mainly of perennial herbaceous vegetation. Strive to achieve within 25 to 30 yrs after full implementation.

- In the grasslands on FC range have effective herbaceous ground cover of 80% with the majority of the ground cover comprised of perennial herbaceous vegetation. Strive to achieve within 25 to 30 yrs after full implementation.

**E. Wildlife**

- Have 30% of the available forage for wild ungulates as per Ari-Pine Resource Area Desired Future Conditions (12/93). Strive to achieve within 5 years. This will be measured by monitoring wildlife utilization in areas of the herd unit with no cattle grazing (rested pastures/cattle exclosures).

**III. MANAGEMENT**

Two Term Grazing Permits will be issued. One will be issued to Taylor Stake LDS for 199 head of Cow/Calves with a 7-month season of use (May 1 to November 30). The other will be issued to Williams Family for 11 head of cows/calves, also with a 7-month season of use (May 1 to November 30). The grazing rotation is as follows:

**Year 1**

NW Willow	May 1 to May 23
Pulp Mill	May 24 to June 21
Gov't Tank	June 22 to July 7
NE Willow	July 8 to July 14
SE Willow	July 15 to July 28
Sackett	July 29 to Aug 11
Cottonwood	Aug 12 to Sept 10
Yarrow	Sept 11 to Sept 20
Ranch	Sept 21 to Sept 30
East Sundown	Oct 1 to Oct 17
SW Willow	Oct 18 to Nov 6
West Sundown	Nov 7 to Nov 30
Bear Springs	Rest

**Year 2**

East Sundown	May 1 to May 16
West Sundown	May 17 to June 8
NW Willow	June 9 to July 1
SW Willow	July 2 to July 20
Bear Springs	July 21 to Aug 19
Cottonwood	Aug 20 to Sept 14
Sackett	Sept 15 to Sept 28
SE Willow	Sept 29 to Oct 10
NE Willow	Oct 11 to Oct 17
Gov't Tank	Oct 18 to Nov 2
Pulp Mill	Nov 3 to Nov 30
Yarrow	Rest
Ranch	Rest

**Year 3**

Gov't	May 1 to May 16
Pulp Mill	May 17 to June 13
SW Willow	June 14 to July 1
Sackett	July 2 to July 15
Phelps	July 16 to July 30
Cottonwood	July 31 to Aug 11
Bear Springs	Aug 12 to Sept 8
Yarrow	Sept 9 to Sept 19
Ranch	Sept 20 to Sept 30
West Sundown	Oct 1 to Oct 22
NW Willow	Oct 23 to Nov 14

**Year 4**

SE Willow	May 1 to May 13
SW Willow	May 14 to May 31
East Sundown	June 1 to June 17
West Sundown	June 18 to July 10
Ranch	July 11 to July 20
Yarrow	July 21 to July 31
Aztec	Aug 1 to Aug 15
Bear Springs	Aug 16 to Aug 26
Cottonwood	Aug 27 to Sept 5
Sackett	Sept 6 to Sept 19
NW Willow	Sept 20 to Oct 11

East Sundown Nov 15 to Nov 30  
SE Willow Rest  
NE Willow Rest

NE Willow  
Gov't Tank  
Pulp Mill  
Phelps

Oct 12 to Oct 18  
Oct 19 to Nov 2  
Nov 3 to Nov 30  
Rest

**Year 5**

Sackett May 1 to May 15  
Phelps May 16 to May 31  
Cottonwood June 1 to June 11  
Bear Springs June 12 to June 23  
Aztec June 24 to July 9  
East Sundown July 10 to July 26  
SW Willow July 27 to Aug 13  
NE Willow Aug 14 to Aug 20  
Pulp Mill Aug 21 to Sept 17  
Gov't Tank Sept 18 to Oct 3  
SE Willow Oct 4 to Oct 16  
NW Willow Oct 17 to Nov 7  
West Sundown Nov 8 to Nov 30  
Yarrow Rest  
Ranch Rest

**Year 6**

Pulp Mill  
Gov't Tank  
East Sundown  
West Sundown  
Ranch  
Yarrow  
Aztec  
Bear Springs  
Cottonwood  
Phelps  
Sackett  
SE Willow  
NW Willow  
NE Willow  
SW Willow

May 1 to May 28  
May 29 to June 12  
June 13 to June 29  
June 30 to July 22  
July 23 to Aug 2  
Aug 3 to Aug 14  
Aug 15 to Aug 30  
Aug 31 to Sept 11  
Sept 12 to Sept 21  
Sept 22 to Oct 7  
Oct 8 to Oct 21  
Oct 22 to Nov 4  
Nov 5 to Nov 23  
Nov 24 to Nov 30  
Rest

**Year 7**

West Sundown May 1 to May 23  
East Sundown May 24 to June 9  
SW Willow June 10 to June 27  
Sackett June 28 to July 13  
Phelps July 14 to July 28  
Cottonwood July 29 to Aug 8  
Bear Springs Aug 9 to Aug 20  
Aztec Aug 21 to Sept 4  
Yarrow Sept 5 to Sept 15  
Ranch Sept 16 to Sept 26  
SE Willow Sept 27 to Oct 9  
NE Willow Oct 10 to Oct 16  
Gov't Tank Oct 17 to Oct 31  
Pulp Mill Nov 1 to Nov 30  
NW Willow Rest

**Year 8**

SW Willow  
Aztec  
Bear Springs  
Cottonwood  
Phelps  
Sackett  
NE Willow  
Pulp Mill  
Gov't Tank  
West Sundown  
East Sundown  
SE Willow  
NW Willow  
Yarrow  
Ranch

May 1 to May 19  
May 20 to June 4  
June 5 to June 18  
June 19 to June 28  
June 29 to July 13  
July 14 to July 27  
July 28 to Aug 4  
Aug 5 to Aug 31  
Sept 1 to Sept 16  
Sept 17 to Oct 9  
Oct 10 to Oct 26  
Oct 27 to Nov 9  
Nov 10 to Nov 30  
Rest  
Rest

**Year 9**

Phelps May 1 to May 16  
Bear Springs May 17 to May 28  
Aztec May 29 to June 13  
Yarrow June 14 to June 23

**Year 10**

NE Willow  
NW Willow  
West Sundown  
Ranch

May 1 to May 8  
May 9 to May 29  
May 30 to June 19  
June 20 to June 29

Ranch	June 24 to July 4	Yarrow	June 30 to July 10
West Sundown	July 5 to July 25	Bear Springs	July 11 to July 22
East Sundown	July 26 to Aug 10	Cottonwood	July 23 to Aug 3
NW Willow	Aug 11 to Aug 31	Phelps	Aug 4 to Aug 18
SW Willow	Sept 1 to Sept 17	Aztec	Aug 19 to Sept 1
Sackett	Sept 18 to Sept 29	East Sundown	Sept 2 to Sept 18
SE Willow	Sept 30 to Oct 12	Pulp Mill	Sept 19 to Oct 16
NE Willow	Oct 13 to Oct 19	Gov't Tank	Oct 17 to Oct 31
Gov't Tank	Oct 20 to Nov 3	SE Willow	Nov 1 to Nov 13
Pulp Mill	Nov 4 to Nov 30	SW Willow	Nov 14 to Nov 30
Cottonwood	Rest	Sackett	Rest

These dates serve only as a guide and may need to be adjusted annually.

Both permittees will graze their cattle in one herd. The Willow Wash, Sundown and Verde Allotments will be combined into one allotment, which will be called the Willow Wash Allotment. The Bear Springs pasture will be divided and the northern half will be called the Aztec pasture and the Southern half will keep the name of Bear Springs. The Cottonwood Pasture will also be divided and the northern half will be named the Phelps Pasture and the southern half will keep the name of Cottonwood.

Yearlings may be authorized, provided that their numbers equate to the same AUM's.

The desired utilization levels by both wildlife and livestock will be as follows: 25% of herbaceous forage species, 20% of terminal buds of riparian shrubs and trees, and 45% on browse species (see monitoring section for more details).

Livestock shall not enter the allotment until the scheduled date identified on the AOP or Grazing Permit. The Permittee shall provide at least 5 days advance notice of entering the allotment, the location of entry, and the means by which the livestock will be placed on the allotment. All livestock, including strays shall be removed from the allotment by the last day shown on the AOP and Grazing Permit.

All livestock must be branded or marked, as identified on the current brand certificates in the Term Grazing Permit.

A request for an extension of the grazing season must be received in writing at least 30 days before the end of the season, which shall state the reason for extension. Excess forage is not automatic grounds for approving extensions. Approval will be determined on resource needs (soil protection, seed crop for next year, etc.) and not based on permittee convenience. Approval applies to only current year and previous years' approval does not constitute automatic approval for succeeding years. Any extensions will be paid for at the current grazing fee rate. A request for non-use must be received in writing at least 45 days prior to the grazing season.

Livestock may be moved from pasture to pasture within 3 days of the planned rotation dates. At least 90 percent of the permitted livestock must be moved by the scheduled date, and all livestock must be moved into the correct pasture within 3 days after the scheduled leave date. The permittee must notify the District Ranger if there is a need to deviate from planned rotation dates.

Livestock allowed to remain in pastures beyond the specified rotation date, allowed to drift between pastures, or allowed in a rested pasture will be considered a violation of the Term Grazing Permit. Animals on the allotment after the "off" date may be billed for at the unauthorized use rate and may be subject to other administrative actions on the permit.

Livestock will be managed to avoid concentrated use in any one area, especially riparian areas. A full-time rider may be necessary to disperse livestock and deter concentrations in preferred areas. Permittee shall manage livestock to utilize the less preferred areas by hauling water, placing salt or supplement feed, and herding as needed to achieve proper use.

Salt and mineral blocks may be placed in lightly used areas until the desired level of forage use is achieved. Blocks will not be placed in areas within a quarter mile of water or a riparian area and ideally no closer than 1/2 mile. Blocks will not be placed in over-used areas, meadow bottoms, along roads, along trails, or in heavily used recreation areas. Every time blocks are put out, they need to be placed at different sites. Blocks will be placed on sites not susceptible to erosion.

The permittee is encouraged to have off-Forest range to use in the event drought, excess forage utilization or other unforeseen events, which necessitate early livestock removal. When these conditions occur, the District Ranger, with input from the permittee, will make the determination if livestock removal is required for resource protection. Drought situations may alter grazing sequence or length of grazing period. The season or numbers may be adjusted in proportion to the amount of moisture that has been received to date.

The number of livestock and/or season of use may be adjusted if the forage use standards or other management objectives are not being met. Livestock will be moved to the next pasture in the grazing schedule or off the Forest when utilization standards are exceeded.

#### **IV. Improvements**

The range improvements planned for the allotment include:

Construct four miles of division fence (3 wire) to split Bear Springs Pasture, and construct five miles of division fence to split the Cottonwood Pasture. Forest Service will supply materials and Permittee will install.

Reconstruct 3 miles of the Sundown west allotment boundary fence, which is a four-strand fence. Forest Service will supply materials and Permittee will install.

Install one mile of pipeline from Coyote Tank to the southwest corner of the Pulpmill Pasture. Forest Service will supply materials and Permittee will install.

Construct a new corral between Bear Springs and Cottonwood Pastures. Permittee will supply materials and build.

Construct a stock tank in Bear Springs Pasture in Section 29 or 32, and a stock tank in Section 5 in the Sackett Pasture.

Construct two Trick Tanks, one in the Ranch Pasture and the other in the Yarrow Pasture. The Forest Service will seek grant for half of the funding.

Rebuild 3 miles of allotment boundary fence along the west boundaries of the Ranch and Yarrow Pastures and 4 miles between the Yarrow - Bear Springs Pastures and between the Ranch - Sackett/East Sundown Pastures. Forest Service will supply materials and Permittee will install.

Thin 2,272 acres of pinyon-juniper woodland through manual or mechanical thinning. Thin 10,620 acres of pinyon-juniper through fuelwooding (commercial, personal use, service contract or other kinds of thinning). Strive to achieve a minimum of 100 acres of Pushing/ Fuelwooding per year or 500 acres in 5 years after this AMP is signed. Forest Service will be responsible for all the fuelwooding, heritage clearances, block layout and ½ the acres of pushing. The permittee is responsible for the other half of the pushing.

Maintain 1,143 acres of grasslands, to remove pinyon-juniper reinvasion. Strive to achieve a minimum of 300 acres per year. Forest Service will be responsible for the block layout, heritage surveys (if necessary) and ½ of the maintenance. The permittee will be responsible for the other half of the maintenance.

Specific locations of the PJ thinning and grasslands maintenance are on the attached maps.

Pasture	Compartment	Stand	Current VSS	Desired VSS	Acres	Treatment
Pulp Mill	5137	11	5C	5A	947	Mechanical thinning
Pulp Mill	5137	12	5C	4B	299	Mechanical thinning
Pulp Mill	5137	16	5C	4A	449	Mechanical thinning
Gov't Tank	5138	1	5C	4A	480	Fuelwood
Gov't Tank	5138	2	5C	2B	350	Fuelwood
Gov't Tank	5138	5	opening	opening	298	Mechanical thinning
Gov't Tank	5138	8	opening	opening	108	Mechanical thinning
Gov't Tank	5138	9	opening	opening	30	Mechanical thinning
NW Willow	5139	19	opening	opening	219	Mechanical thinning

NW Willow	5139	13	opening	opening	16	Mechanical thinning
NE Willow	5140	1	opening	opening	90	Mechanical thinning
NE Willow	5140	4	5C	5A	577	Mechanical thinning
NE Willow	5140	5	5C	3A	808	Fuelwood
SW Willow	5141	2	opening	opening	101	Mechanical thinning
SW Willow	5141	8	opening	opening	55	Mechanical thinning
SW Willow	5141	20	5C	3A	806	Fuelwood
SW Willow	5141	31	5C	4B	807	Fuelwood
SE Willow	5142	2	3C	3B	428	Manual Treatment
SE Willow	5142	3	opening	opening	75	Mechanical thinning
SE Willow	5142	5	5C	4A	751	Fuelwood
SE Willow	5142	20	5C	3A	748	Fuelwood
W Sundown	8074	2	5C	2B	270	Fuelwood
W Sundown	8074	18	5C	4B	383	Fuelwood
W Sundown	8074	24	4C	4A	799	Fuelwood
W Sundown	8074	25	5C	4A	192	Fuelwood
W Sundown	8074	29	5C	5A	526	Fuelwood
E Sundown	8050	2	5C	4B	488	Fuelwood
E Sundown	8050	9	5C	5A	338	Fuelwood
E Sundown	8050	11	opening	opening	15	Mechanical thinning
E Sundown	8050	14	5C	4A	356	Fuelwood
E Sundown	8050	25	opening	opening	12	Mechanical thinning
E Sundown	8050	29	5C	4B	61	Fuelwood
Sackett	8051	6	opening	opening	20	Mechanical thinning
Sackett	8051	10	opening	opening	48	Mechanical thinning
Sackett	8051	14	opening	opening	56	Mechanical thinning
Sackett	8051	15	4C	4A	436	Fuelwood
Sackett	8051	28	5C	4A	187	Fuelwood
Sackett	8051	31	5C	3B	29	Fuelwood
Sackett	8051	32	5C	3C	22	Fuelwood
Sackett	8051	37	5C	4B	52	Fuelwood
Cottonwood	8052	4	5C	4A	168	Fuelwood
Cottonwood	8052	5	5C	4A	61	Fuelwood
Cottonwood	8052	16	5C	4B	158	Fuelwood
Cottonwood	8053	1	5C	4A	95	Fuelwood
Cottonwood	8053	3	4C	4A	103	Fuelwood
Bear Springs	8056	15	4C	4A	410	Fuelwood
Bear Springs	8057	1	5C	4A	18	Fuelwood
Bear Springs	8057	6	5C	5A	436	Fuelwood
Bear Springs	8057	14	5C	4A	58	Fuelwood
Bear Springs	8058	4	5C	4B	149	Fuelwood
Bear Springs	8058	12	5C	4B	75	Fuelwood

### **Range Improvement Standards**

All assigned range improvements will be maintained by the permittee. When the annual grazing application is approved, in whole or in part, livestock will not be placed on an allotment or moved into pastures if permit requirements concerning range improvement maintenance are not met. Proper maintenance of the range improvements will insure that the condition of the improvements is adequate to hold livestock in a pasture and will extend the useful life of the improvements. Forest officers periodically will inspect assigned improvements for compliance with maintenance standards prior to livestock entry or movement dates. All range improvements are the property of the U.S. Government.

A permit modification will be prepared for approved projects each year. Permittees will sign a permit modification form for the project and will sign for materials furnished by the Forest. Ground disturbing activities will not be initiated by the permittee until proper clearances have been approved. Annual fence maintenance does not require approval.

#### **A. Fences. Standards for maintenance and construction are:**

1. All allotment boundary fences are to be maintained prior to livestock entering National Forest lands. Livestock will not be permitted to enter the Forest until fences have been properly maintained to keep livestock where they are placed.

2. Each permittee is responsible for the maintenance of all or a portion of an allotment boundary fence. A permittee will not be allowed to place livestock on the allotment if the neighboring permittee does not maintain their assigned allotment boundary fence.

3. Pasture fences will be maintained before moving livestock to a new pasture.

4. Old wire and steel fence posts will be removed from the Forest.

5. Broken wire will be spliced with good quality double strand, 12-1/2 gauge barbed or smooth wire.

6. Wire spacing will be similar to original spacing. The top wire height will not exceed 42 inches. The bottom wire will be smooth wire. The bottom wire will be 18 inches from the ground. The remaining wire strands will be spaced as follow, counting from the bottom wire: 18 inches, 24 inches, 32 inches, and 42 inches.

7. Wire will not be over tightened and will be stretched to remove slack.

8. Broken posts or rotten wood posts will be replaced with a steel post or a juniper or treated wood post greater than 5 inches in diameter.
9. Brace posts will be maintained in tight and serviceable condition.
10. Steel posts that have settled may need to be jacked up and possibly moved. Leaning steel posts will be straightened.
11. Gates will be maintained so they can be opened easily. Gate sticks will be 2-3 inches in diameter. Smooth wire will be used for gate loops.
12. At least 90 percent of fence stays will be sound. Replacement stays will be good quality wood, 1-1/2-inch by 3 inches in diameter. The bottom of each stay will rest on the ground. Galvanized stay wire will be used for tying stays. For 20-foot spacing between posts, three stays shall be used.
13. Missing staples and fence clips will be replaced.
14. All trees, which have fallen across the fence line will be cut and removed from the fence right-of-way.

B. Water. Issuance of this grazing permit and the permittee's acceptance of the permit does not convey ownership of a water right to the permittee(s) but allows the use of a portion of it within the terms of the appropriation. The Forest has filed for water rights on these waters with the State of Arizona. Grazing domestic livestock may not be possible without these water rights. The Forest will retain ownership of the water rights as appropriated to the United States Forest Service (USFS) for current and future grazing permittees as well as for wildlife and recreation consumptive needs. Ownership of the water rights belonging to the USFS will assure that the use of the water will be appurtenant to the land and will be available for both current and future grazing permittees.

Stock water is important for proper livestock distribution. Water must be used to demonstrate beneficial use in order to maintain water rights. If natural water is not available, the permittee may haul water to obtain proper livestock distribution. The following will be done:

1. Trick Tanks.

- a. Fences around water sources and equipment shall be maintained annually to FS standards.
- b. Collection boxes, inlet pipes, and water troughs will be clean of sediment and debris before the improvement is used and during the grazing season as needed.

c. Broken pipe will be repaired or replaced. Material not usable will be removed from the Forest and disposed of properly.

d. Troughs that leak will be repaired. Troughs should be level. Overflow pipes should be placed to avoid creating a boggy area at the trough. Rusted out troughs need to be replaced through a permit modification.

e. Float valves will be cleaned and set to prevent overflow. They shall be checked regularly when pasture is in use and shall contain a protective cover to prevent damage from livestock.

f. Troughs shall have escape ramps for small mammals and birds. Escape ramps shall also be maintained.

g. Trick tank support structure and tin shall be inspected annually to insure that the improvement is sound. All damages need to be repaired.

## 2. Stock Tanks.

a. Check stock tanks for seepage.

b. As a general rule, spillways need to be free of debris and obstructions. Eroded portions need to be repaired when they exist.

c. Tanks need to be cleaned to their original capacity whenever drought or other circumstances occur that result in the tanks being dry. Special care will be taken during cleaning to prevent future water loss. The work will be coordinated with the District Ranger prior to initiating repairs.

## **V. Monitoring and Evaluation**

It should be recognized that monitoring is not an in depth analysis but a measure of indicators that may trigger further detailed analysis of a particular resource. Either monitoring or detailed analysis may trigger immediate corrective action on the allotment on a seasonal basis or as a change in the AMP and permit.

The following techniques will be used to monitor grazing management:

### A. UTILIZATION

Utilization should be determined according to a methodology described in "Utilization Studies and Residual Measurements". Compare actual utilization with allowable standards to determine compliance. Validation of grazing dates and stocking rates can be determined based on actual livestock use in comparison to utilization data.

One to three places in each pasture were selected for utilization monitoring. These areas are identified on the enclosed map, and will be referred to as Key Areas.

Utilization Data will be collected from key areas in each pasture, which are identified on the enclosed key area map. Key species will be monitored in each key area for actual use. Key species for the respective key areas are:

Pulp Mill Pasture

Key Area A: galleta (*Hilaria jamesii*) and blue grama (*Bouteloua gracilis*)

Key Area B: blue grama and alkali sacaton (*Sporobolus airoides*)

Key Area C: blue grama and galleta

Government Tank Pasture

Key Area D: blue grama and western wheatgrass (*Agropyron smithii*)

Key Area BB: blue grama

Northwest Willow Pasture

Key Area J: western wheatgrass, cottonwood (*Populus angustifolia*) and blue grama

Key Area K: blue grama and needleandthread (*Stipa comata*)

Northeast Willow Pasture

Key Area L: western wheatgrass and blue grama

West Sundown Pasture

Key Area E: needleandthread and blue grama

Key Area F: blue grama and western wheatgrass

Key Area G: blue grama and western wheatgrass

East Sundown Pasture

Key Area H: wolftail (*Lycurus phleoides*) and blue grama

Key Area I: blue grama and western wheatgrass

Southeast Willow Pasture

Key Area N: blue grama

Key Area O: blue grama and sideoats grama (*Bouteloua curtipendula*)

Southwest Willow Pasture

Key Area M: blue grama

Key Area CC: blue grama and western wheatgrass

Sackett Pasture

Key Area P: western wheatgrass and blue grama

Key Area Q: blue grama and western wheatgrass

Cottonwood Pasture

Key Area W: western wheatgrass and blue grama, cottonwood

Key Area V: blue grama and western wheatgrass

Key Area U: blue grama and western wheatgrass

Bear Springs Pasture

Key Area R: western wheatgrass and blue grama

Key Area S: blue grama and western wheatgrass

Key Area T: blue grama and spike muhly (*Muhlenbergia wrightii*)

Ranch Pasture

Key Area AA: western wheatgrass and blue grama

Yarrow Pasture

Key Area Y: western wheatgrass and blue grama

Key Area Z: western wheatgrass and spike muhly

Key areas and key species may need adjusting, based on better information, additional improvements, etc.

The desired combined (wildlife and livestock) utilization of these key species (herbaceous) in key areas is 25%. Utilization could not be expected to exactly meet 25% each year, therefore in the long-term a 20 to 30% use would be considered within the acceptable range for this analysis. If annual utilization is above 30% or trends of annual utilization are above 25%, district personnel and the permittee need to re-evaluate the annual stocking. The above ranges apply both to the key species and key areas. If utilization falls outside of these ranges, either high or low, the stocking levels and/or management will be reevaluated. If utilization of one key area or key species is above 30%, then management of that key area should be reassessed, such as salt placement, water locations, etc. The desired utilization levels of browse species (cliffrose) is set at 45% and riparian species (cottonwood) is set at 20% of the terminal buds.

Utilization monitoring is the responsibility of the Permittee. The measurements should be taken within 10 days after the scheduled pasture move date specified in the Annual Operating Plan. The data sheets should be turned into the District Ranger within 2 weeks of the scheduled move date. Pasture use monitoring should be documented and filed in 2210/2230. Successive monitoring data will be used in validating pasture and allotment capacities. Current information on precipitation, forage production, and/or use levels may be used to adjust annual grazing use. The permittee should also keep a copy for their records.

## B. COMPOSITION AND DENSITY

To determine changes in composition and density, long-term validation will be accomplished through re-reading Parker 3 Step clusters and/or establishing Daubenmire

(cover/frequency) transects as per R3 Rangeland Guide. These range clusters are suitable for determining long-term trend in vegetation and should be read between the 3<sup>rd</sup> and 5<sup>th</sup> year and again the ninth or tenth year after the signature of the decision. Great changes may not occur during the 10-year period but trend indications should be detected. The trend indications gathered from transects, should be measured against the desired condition/objectives.

New clusters may be located within each pasture and should be established and read before the 5<sup>th</sup> year and read again the ninth or tenth year after the signature of the decision.

#### C. GROUND COVER

Determination of ground cover can be replicated at range clusters. In most cases, an increase in vegetation cover from baseline measures is considered as moving toward Desired Conditions (DC), a decrease is considered as not accomplishing DC. Data will be collected on transects during the ninth or tenth year (same as vegetation monitoring).

#### D. CAPACITY ESTIMATES

Objective is to determine if original capacity estimates based on desired use levels are correct for individual pastures, considering vegetation, landscape, resource conditions, and forage preference. A combination of utilization monitoring, composition and density and ground cover will be used to validate capacity estimates. The utilization monitoring, composition, density and ground cover data, yearly precipitation data from local stations and any other pertinent information should be reviewed by the District Ranger, Range and Wildlife personnel from the Forest Service, along with the permittee, between the 5<sup>th</sup> and 6<sup>th</sup> years. Due to the unpredictability of the results of the data collected, evaluations of stocking will need to be made at this time. Validation of capacity estimates may result in further adjustments in stocking rates, season of use, or both, either up or down.

#### E. ACTIONS

Monitoring will be used to adjust or amend previously described actions in the decision document or AMP. Information on validation monitoring should be shared with the permittee and others concerned with the decision. If the monitoring data is not achieving or moving toward the Desired Conditions, Forest Service personnel must analyze the problem and decide on a course of action. If necessary, an ID Team may be instituted to determine the corrective action needed. Re-initiation of NEPA may not be necessary if the action is still within the scope of the original decision.

Failure to comply, by the permittee, with the requirements of this Allotment Management Plan may result in suspension or cancellation of their Term Grazing Permit.

Willow Wash Allotment  
Range Improvement List

Permit #02057

Improvement Number	Improvement Name	Maintenance Responsibility	Length (Miles)
20501	SW Willow - East Sundown Fence	Willow Wash Permittee	3.38
20502	NW Willow - East Sundown Fence	Willow Wash Permittee	1.49
20503	Ranch - East Sundown Fence	Willow Wash Permittee	3.96
20504	Ranch - West Sundown Fence	Willow Wash Permittee	1.13
20505	Sundown - Park Day Fence	Willow Wash Permittee	4.57
20506	Sundown - Park Day Fence	Willow Wash Permittee	2.24
20507	Sundown - Park Day Fence	Willow Wash Permittee	1.4
20508	Sundown Pasture Division Fence	Willow Wash Permittee	5.72
20509	Willow Wash - Park Day Fence	Willow Wash Permittee	2.96
20510	Willow Wash - Park Day Fence	Willow Wash Permittee	1.41
20511	Willow Wash - Park Day Fence	Willow Wash Permittee	3.33
20512	Willow Wash - Forest Boundary Fence	Willow Wash Permittee	4.96
20513	Forest Boundary - Government Tank Fence	Willow Wash Permittee	1.23
20514	Government Tank Holding Pasture Fence	Willow Wash Permittee	1.37
20515	Government Tank - NW Willow Fence	Willow Wash Permittee	0.96
20516	NE Willow - SE Willow Pasture Division Fence	Willow Wash Permittee	1.94
20517	NE Willow - NW Willow Pasture Division Fence	Willow Wash Permittee	2.52
20518	NE Willow - Government Tank HP Fence	Willow Wash Permittee	1.33
20519	NW Willow - SW Willow Pasture Division Fence	Willow Wash Permittee	2.16
20520	SW Willow - SE Willow Pasture Division Fence	Willow Wash Permittee	2.41
20521	Sackett - SE Willow Pasture Division Fence	Williams Family	2.16
20522	Sackett - SW Willow Pasture Division Fence	Williams Family	2.2
20523	Bagnal Stock Tank Waterlot Fence	Willow Wash Permittee	1.09
20524	Ranch - Sackett Pasture Division Fence	Willow Wash Permittee	2.22
20525	Hwy 277 Right of Way Fence	ADOT	6.02
20526	Hwy 260 Right of Way Fence	ADOT	16.19
20527	Willow Wash - Heber Fence	Willow Wash Permittee	0.47
20528	Bear Sprgs - Cottonwood Pasture Division Fence	Willow Wash Permittee	6.88
20529	Reservation Boundary Fence	Willow Wash Permittee	7.3
20530	Willow Wash - Heber Fence	Willow Wash Permittee	3.3
20531	Willow Wash - Heber Fence	Willow Wash Permittee	2.57

Willow Wash Allotment  
Range Improvement List

Permit #02057

20532	Yarrow - Bear Sprgs Pasture Division Fence	Willow Wash Permittee	2.89
20001	Willow Wash - Clay Springs Fence	Clay Springs Permittee	2.86
20002	Willow Wash - Clay Springs Fence	Clay Springs Permittee	3.07
20015	Willow Wash - Clay Springs Fence	Clay Springs Permittee	1.58
20016	Willow Wash - Clay Springs Fence	Clay Springs Permittee	6.76
20533	Scott Stock Tank # 1	Willow Wash Permittee	
20534	Scott Stock Tank #2	Willow Wash Permittee	
20535	Coyote Stock Tank	Willow Wash Permittee	
20536	Cressey Stock Tank	Willow Wash Permittee	
20537	Government Tank Pipeline	Willow Wash Permittee	4.46
20538	Coyote Pipeline Extension	Willow Wash Permittee	0.73
20539	Upper Pine Stock Tank	Willow Wash Permittee	
20540	Pine Stock Tank	Willow Wash Permittee	
20541	Flood Stock Tank	Willow Wash Permittee	
20542	Little Pug Stock Tank	Willow Wash Permittee	
20543	Big Pug Stock Tank	Willow Wash Permittee	
20544	Woodland Stock Tank	Willow Wash Permittee	
20545	Swale Stock Tank	Willow Wash Permittee	
20546	Swale Stock Tank Waterlot Fence	Willow Wash Permittee	
20547	Big Pug Stock Tank waterlot Fence	Willow Wash Permittee	
20548	Long Hollow Stock Tank	Willow Wash Permittee	
20549	Long Hollow Well	Willow Wash Permittee	
20550	Long Hollow Stock Tank Waterlot	Willow Wash Permittee	
20551	Long Hollow Corrals	Willow Wash Permittee	
20552	Willow Wash Trick Tank	Willow Wash Permittee	
20553	Diversion Stock Tank	Willow Wash Permittee	
20554	Decker Stock Tank	Willow Wash Permittee	
20555	Day Stock Tank	Willow Wash Permittee	
20556	Middle Stock Tank	Willow Wash Permittee	
20557	L D Stock Tank	Willow Wash Permittee	
20558	Bagnal Stock Tank	Willow Wash Permittee	
20559	Jack Rabbit Stock Tank	Willow Wash Permittee	
20560	x IL Stock Tank	Willow Wash Permittee	
20561	Dry Stock Tank	Willow Wash Permittee	
20562	Hidden Stock Tank	Willow Wash Permittee	
20563	Doe Stock Tank	Willow Wash Permittee	
20564	Kay's Stock Tank	Willow Wash Permittee	
20565	Sackett Stock Tank	Willow Wash Permittee	
20566	Sackett Stock Tank Waterlot Fence	Willow Wash Permittee	
20567	Pearce Stock Tank # 2	Willow Wash Permittee	
20568	Pearce Stock Tank # 1	Willow Wash Permittee	

Willow Wash Allotment  
Range Improvement List

Permit #02057

20569	Parker Stock Tank # 1	Willow Wash Permittee	
20570	Parker Stock Tank # 2	Willow Wash Permittee	
20571	Ranch Trick Tank	Willow Wash Permittee	
20572	Jays Stock Tank	Willow Wash Permittee	
20573	Jays Stock Tank Waterlot Fence	Willow Wash Permittee	
20574	Shumway Stock Tank	Willow Wash Permittee	
20575	Headquarters Stock Tank	Willow Wash Permittee	
20576	Frost Stock Tank	Willow Wash Permittee	
20577	Flake Stock Tank	Willow Wash Permittee	
20578	Horseshoe Stock Tank	Willow Wash Permittee	
20579	Horseshoe Stock Tank Waterlot Fence	Willow Wash Permittee	
20580	Telephone Stock Tank	Willow Wash Permittee	
20581	Telephone Stock Tank Waterlot Fence	Willow Wash Permittee	
20582	Ditch Stock Tank	Willow Wash Permittee	
20583	Upper Long Hollow Stock Tank	Willow Wash Permittee	
20584	Upper Long Hollow Waterlot Fence	Willow Wash Permittee	
20585	Rice Seep Stock Tank	Willow Wash Permittee	
20586	West Long Hollow Stock Tank	Willow Wash Permittee	
20587	West Long Hollow Stock Tank Waterlot Fence	Willow Wash Permittee	
20588	Reed Stock Tank	Willow Wash Permittee	
20589	Division Stock Tank	Willow Wash Permittee	
20590	Lanquist Stock Tank	Willow Wash Permittee	
20591	Upper Yarrow Stock Tank	Willow Wash Permittee	
20592	Lower Yarrow Stock Tank	Willow Wash Permittee	
20593	ZB Stock Tank	Willow Wash Permittee	
20594	Verde Road Tank # 1	Willow Wash Permittee	
20595	Decker Stock Tank	Willow Wash Permittee	
20596	Bailey Stock Tank	Willow Wash Permittee	
20597	Bear Stock Tank	Willow Wash Permittee	
20598	Bear Springs Stock Tank	Willow Wash Permittee	
20599	Hall Stock Tank	Willow Wash Permittee	
20600	Hall Stock Tank Waterlot Fence	Willow Wash Permittee	
20601	Trough Spring	Willow Wash Permittee	
20602	Day Spring	Willow Wash Permittee	
20603	Borrow Stock Tank	Willow Wash Permittee	
20604	Buck Stock Tank	Willow Wash Permittee	
20605	Loggers Stock Tank	Willow Wash Permittee	
20606	Phelps Stock Tank	Willow Wash Permittee	
20607	Newman Stock Tank	Williams Family	
20608	Shingle Spring	Willow Wash Permittee	
20609	Hidden Spring	Willow Wash Permittee	

Willow Wash Allotment  
Range Improvement List

Permit #02057

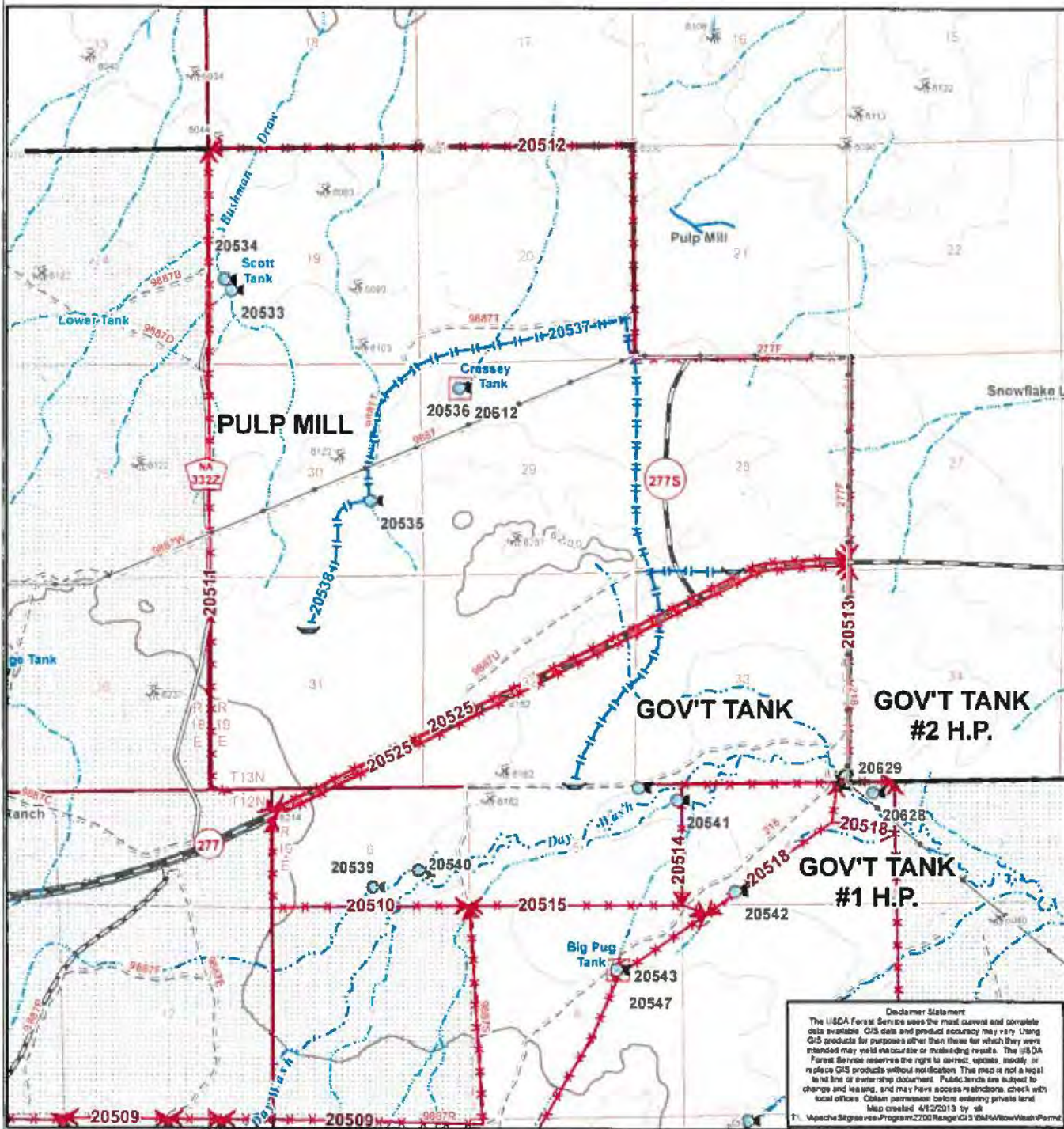
20610	Whitting Stock Tank	Willow Wash Permittee	
20611	Section 19 Fence	Willow Wash Permittee	
20612	Cressey Stock Tank Waterlot Fence	Willow Wash Permittee	
20613	139 Road Tank	Willow Wash Permittee	
20614	JR Stock Tank	Willow Wash Permittee	
20615	Junction Stock Tank	Willow Wash Permittee	
20616	Road Stock Tank	Willow Wash Permittee	
20617	Crooked Road Tank	Willow Wash Permittee	
20618	Rhine Road Tank	Willow Wash Permittee	
20619	West Road Tank	Willow Wash Permittee	
20620	Keating Road Tank	Willow Wash Permittee	
20621	Lewis Road Tank	Willow Wash Permittee	
20622	Stinson Stock Tank	Willow Wash Permittee	
20623	Bag Road Tank	Willow Wash Permittee	
20624	Wood Road Tank	Willow Wash Permittee	
20625	145 Road Tank	Willow Wash Permittee	
20626	Crossover Road Tank	Willow Wash Permittee	
20627	George Road Tank	Willow Wash Permittee	
20628	Government Stock Tank # 1	Willow Wash Permittee	
20629	Government Tank Corrals	Willow Wash Permittee	
20630	Holding Stock Tank	Willow Wash Permittee	
20631	Hidden Stock Tank Waterlot Fence	Willow Wash Permittee	
20632	Yarrow Trick Tank	Willow Wash Permittee	
20633	Bear Springs	Willow Wash Permittee	
20634	East Frost Stock Tank	Willow Wash Permittee	
20635	Thaw Stock Tank	Willow Wash Permittee	

# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: Pulp Mill, Govt Tank  
 #1 HP and #2 HP



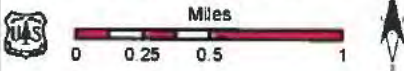
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|-----------------|------------|-------------|--------------------------|
| National Forest | Well       | Waterlot    | Road: Maint Level        |
| Black Mesa RD   | Spring     | Corral      | High Degree User Comfort |
| County Boundary | Pit Tank   | Cattleguard | Mod Degree User Comfort  |
| Other Allotment | Trick Tank | Gate        | Suitable Passenger Cars  |
| Other Owner     | Trough     | Fenceline   | High Clearance Vehicles  |
| Powerline       | Pipeline   |             |                          |



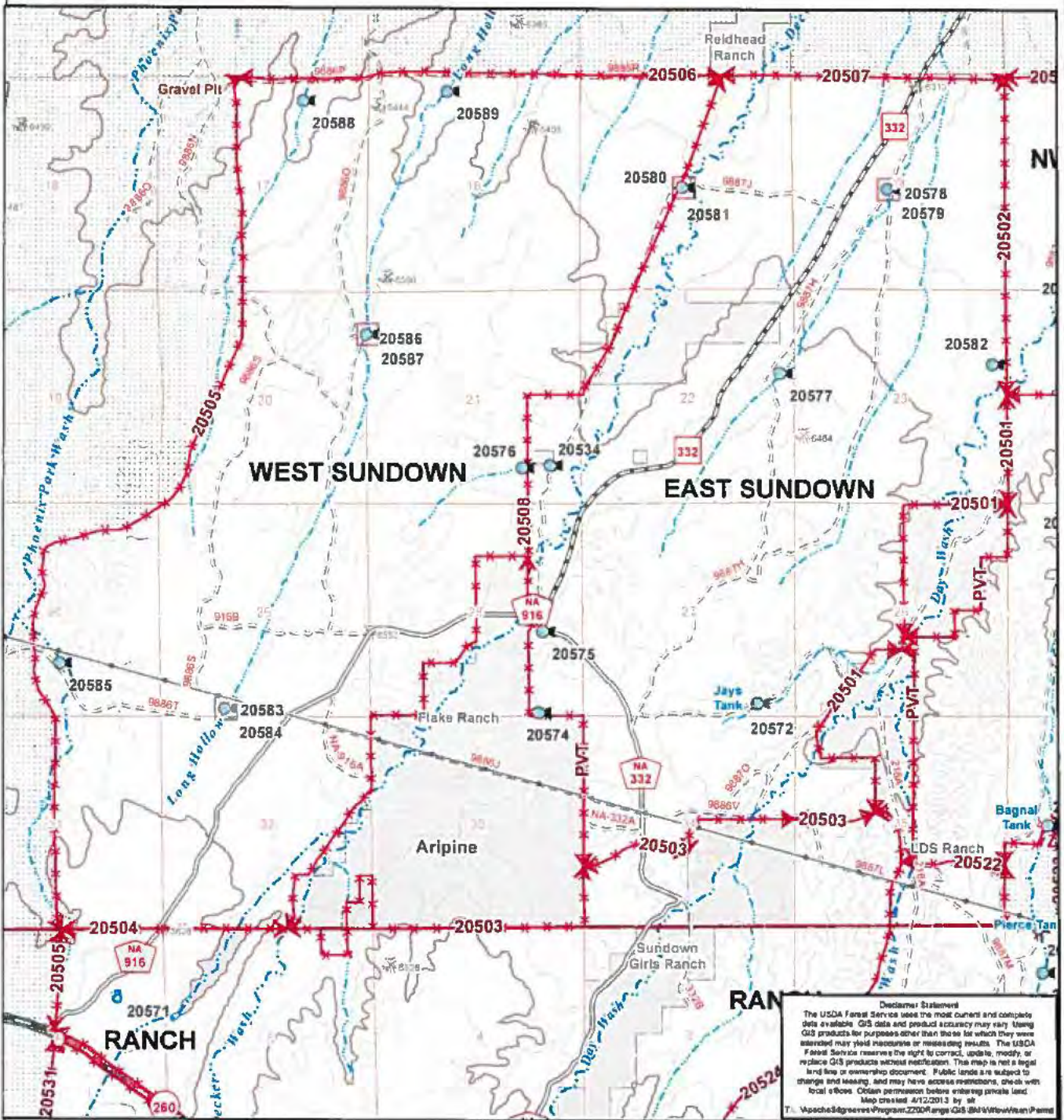
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# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: East Sundown  
 and West Sundown



- |                           |                     |               |                             |
|---------------------------|---------------------|---------------|-----------------------------|
| — National Forest         | <b>Improvements</b> | □ Watertot    | <b>Road: Maint Level</b>    |
| - - - Black Mesa RD       | ⊙ Well              | ⊙ Corral      | — High Degree User Comfort  |
| - · - · - County Boundary | ⊙ Spring            | ⊙ Cattleguard | — Mod Degree User Comfort   |
| ▨ Other Allotment         | ⊙ Pit Tank          | ⊙ Gate        | — Suitable Passenger Cars   |
| □ Other Owner             | ⊙ Trick Tank        | ↔ Fenceline   | --- High Clearance Vehicles |
| — Powerline               | — Trough            | — Pipeline    |                             |

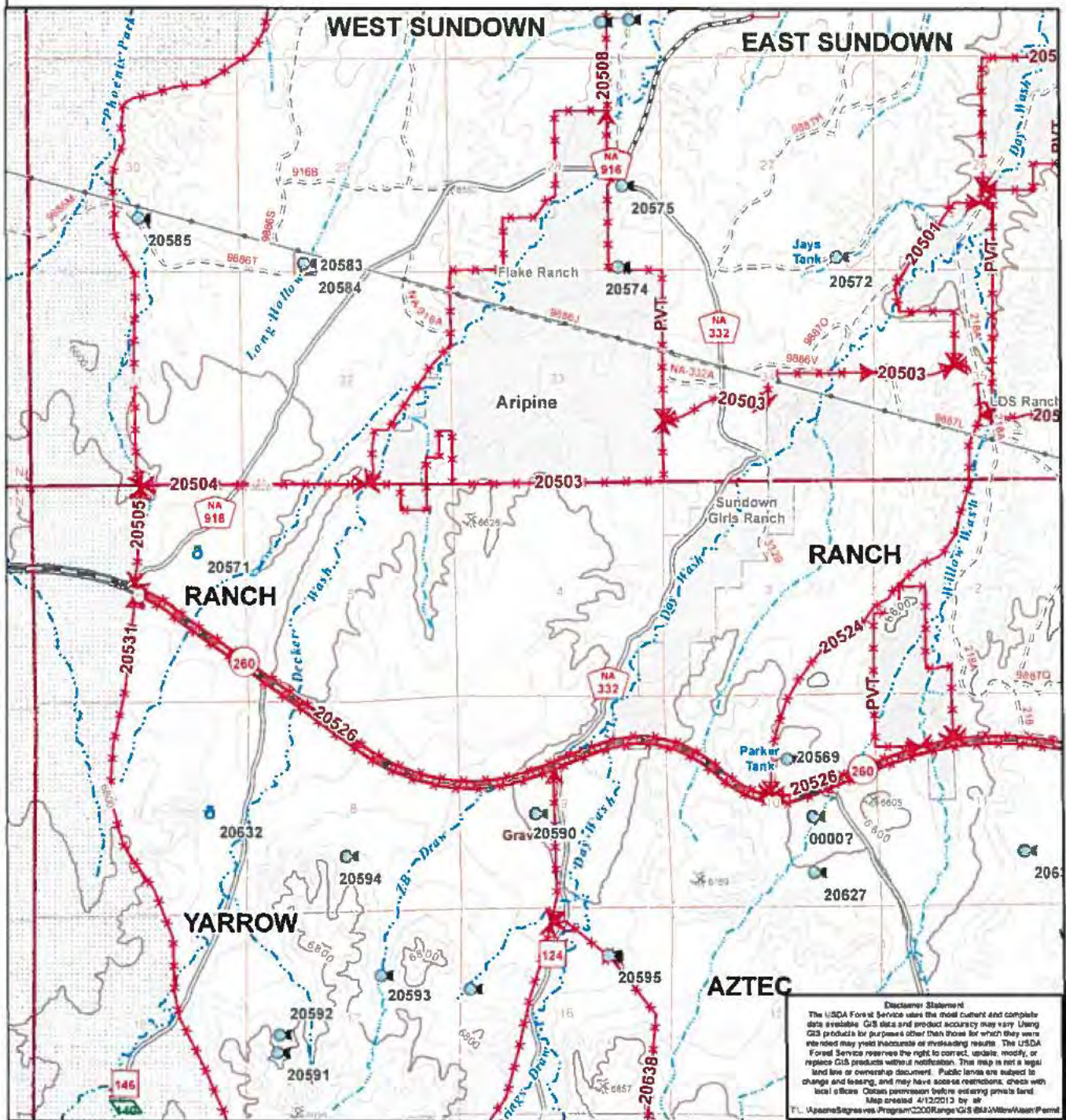


# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: Ranch



- |                 |                     |             |                          |
|-----------------|---------------------|-------------|--------------------------|
| National Forest | <b>Improvements</b> | Waterlot    | <b>Road: Maint Level</b> |
| Black Mesa RD   | Well                | Corral      | US / State Highway       |
| County Boundary | Spring              | Cattleguard | High Degree User Comfort |
| Other Allotment | Pit Tank            | Gate        | Mod Degree User Comfort  |
| Other Owner     | Trick Tank          | Fenceline   | Suitable Passenger Cars  |
| Powerline       | Trough              | Pipeline    | High Clearance Vehicles  |

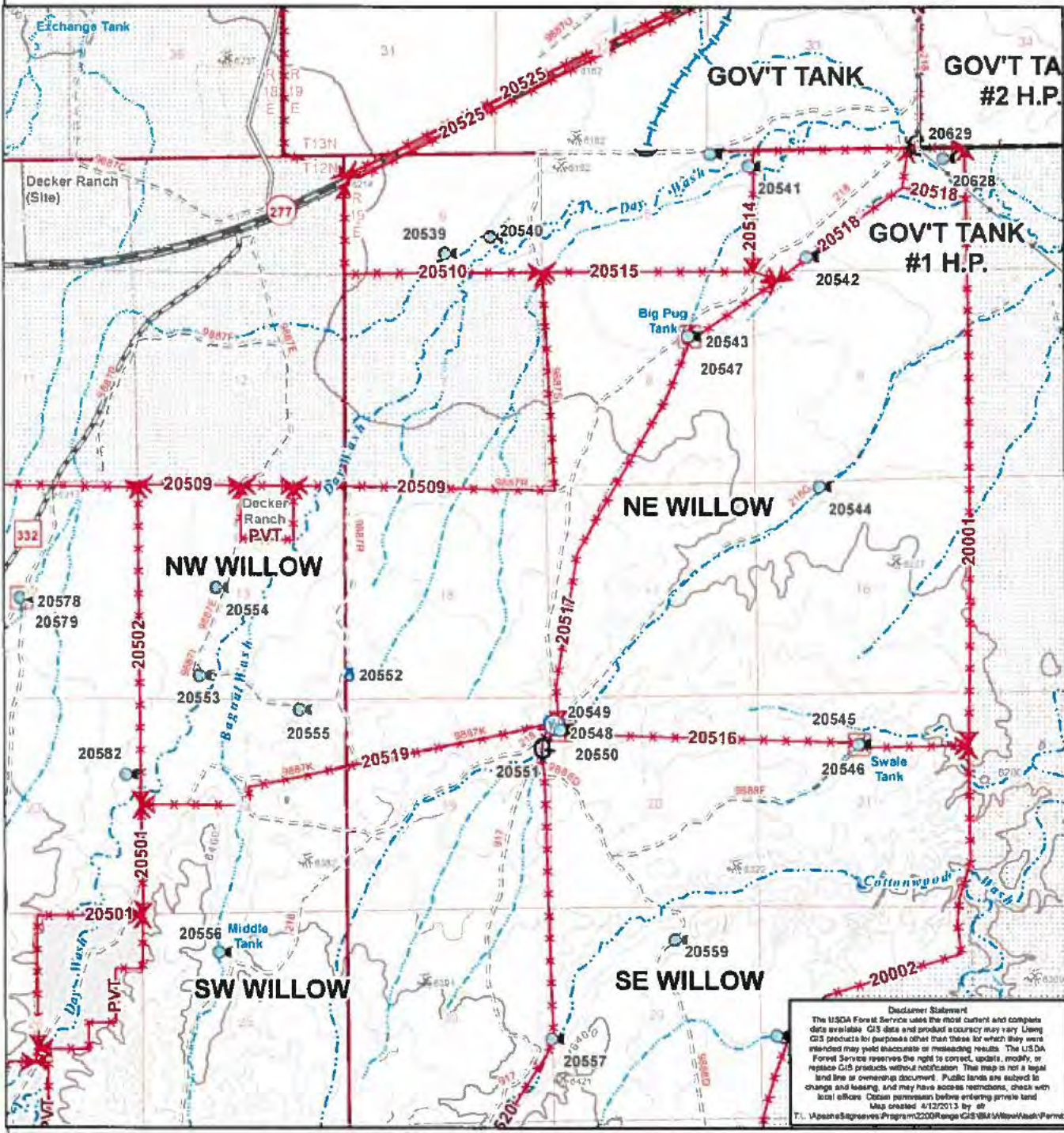


# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: NE Willow  
 and NW Willow



- |                 |            |             |                          |
|-----------------|------------|-------------|--------------------------|
| National Forest | Well       | Waterlot    | Road: Maint Level        |
| Black Mesa RD   | Spring     | Corral      | US / State Highway       |
| County Boundary | Pit Tank   | Cattleguard | High Degree User Comfort |
| Other Allotment | Trick Tank | Gate        | Mod Degree User Comfort  |
| Other Owner     | Trough     | Fenceline   | Suitable Passenger Cars  |
| Powerline       | Pipeline   |             | High Clearance Vehicles  |



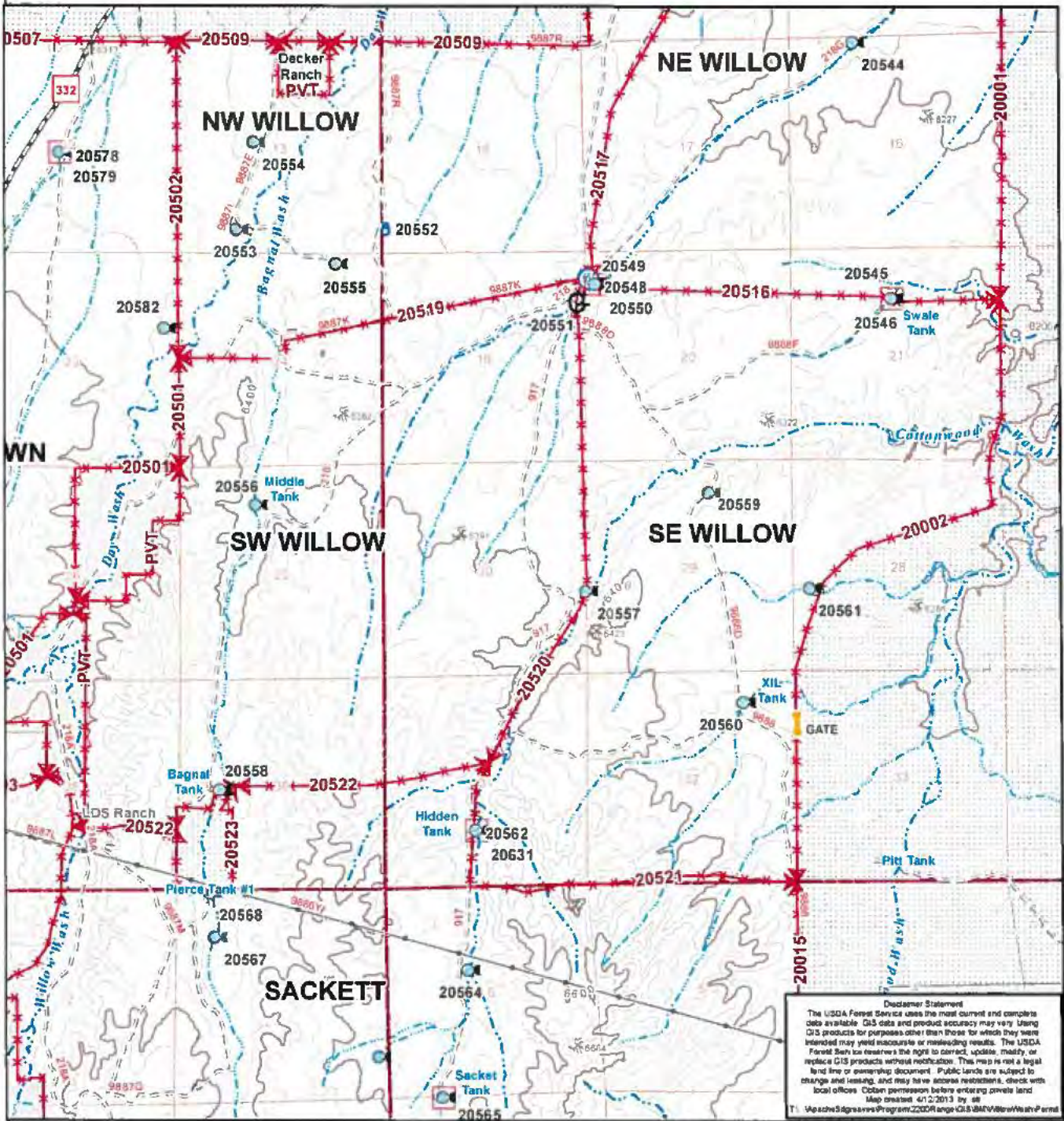
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 T. Apache-Sitgreaves Program 2200 Range GIS 884 Willow Wash/Permit

# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: SE Willow  
 and SW Willow



- |                 |                     |             |                          |
|-----------------|---------------------|-------------|--------------------------|
| National Forest | <b>Improvements</b> | Waterlot    | <b>Road: Maint Level</b> |
| Black Mesa RD   | Well                | Corral      | US / State Highway       |
| County Boundary | Spring              | Cattleguard | High Degree User Comfort |
| Other Allotment | Pit Tank            | Gate        | Mod Degree User Comfort  |
| Other Owner     | Trick Tank          | Fenceline   | Suitable Passenger Cars  |
| Powerline       | Trough              | Pipeline    | High Clearance Vehicles  |



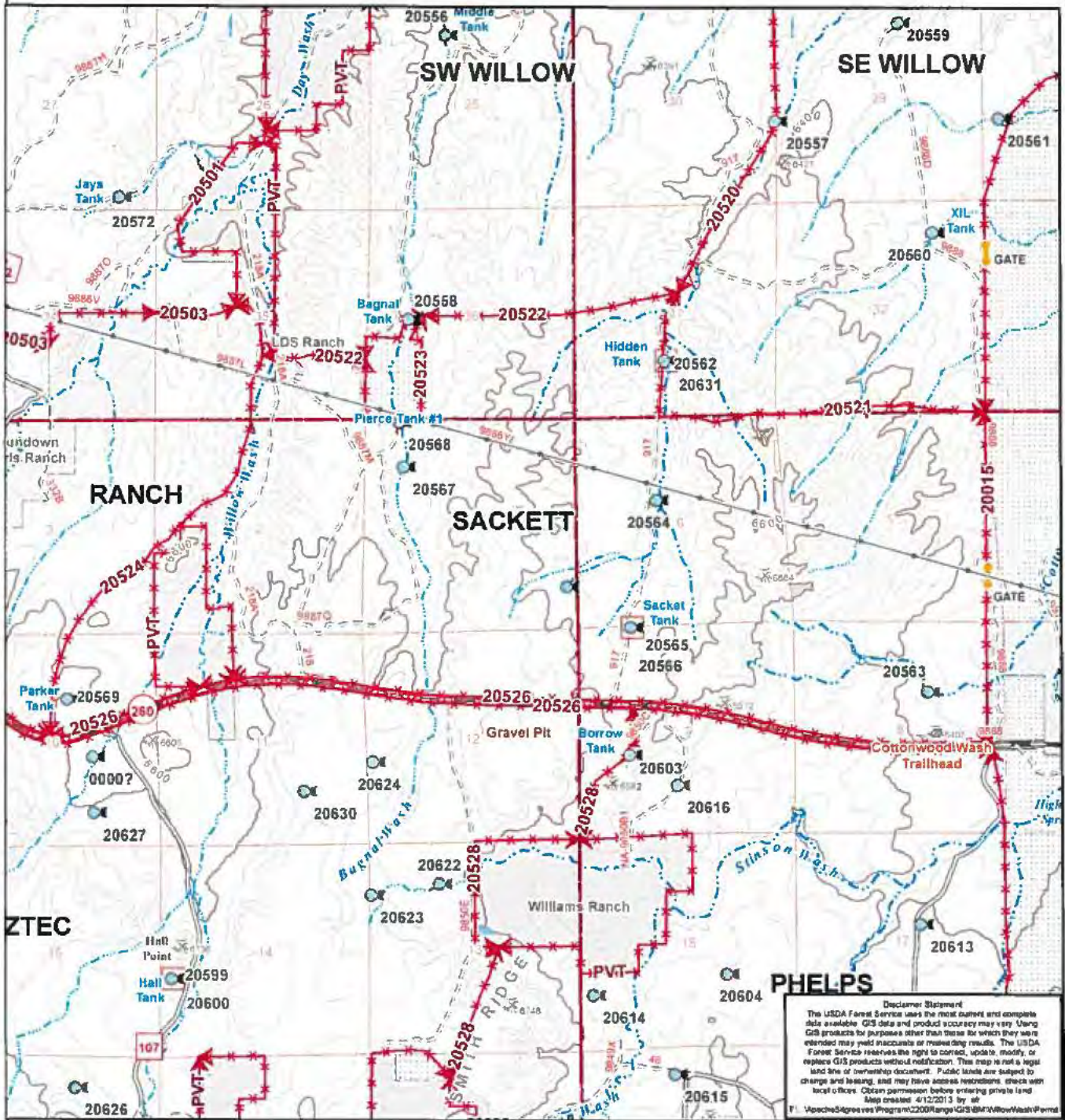
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# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: Sackett



- |                 |                     |             |                          |
|-----------------|---------------------|-------------|--------------------------|
| National Forest | <b>Improvements</b> | Waterlot    | <b>Road: Maint Level</b> |
| Black Mesa RD   | Well                | Corral      | US / State Highway       |
| County Boundary | Spring              | Cattleguard | High Degree User Comfort |
| Other Allotment | Pit Tank            | Gate        | Mod Degree User Comfort  |
| Other Owner     | Trick Tank          | Fenceline   | Suitable Passenger Cars  |
| Powerline       | Trough              | Pipeline    | High Clearance Vehicles  |



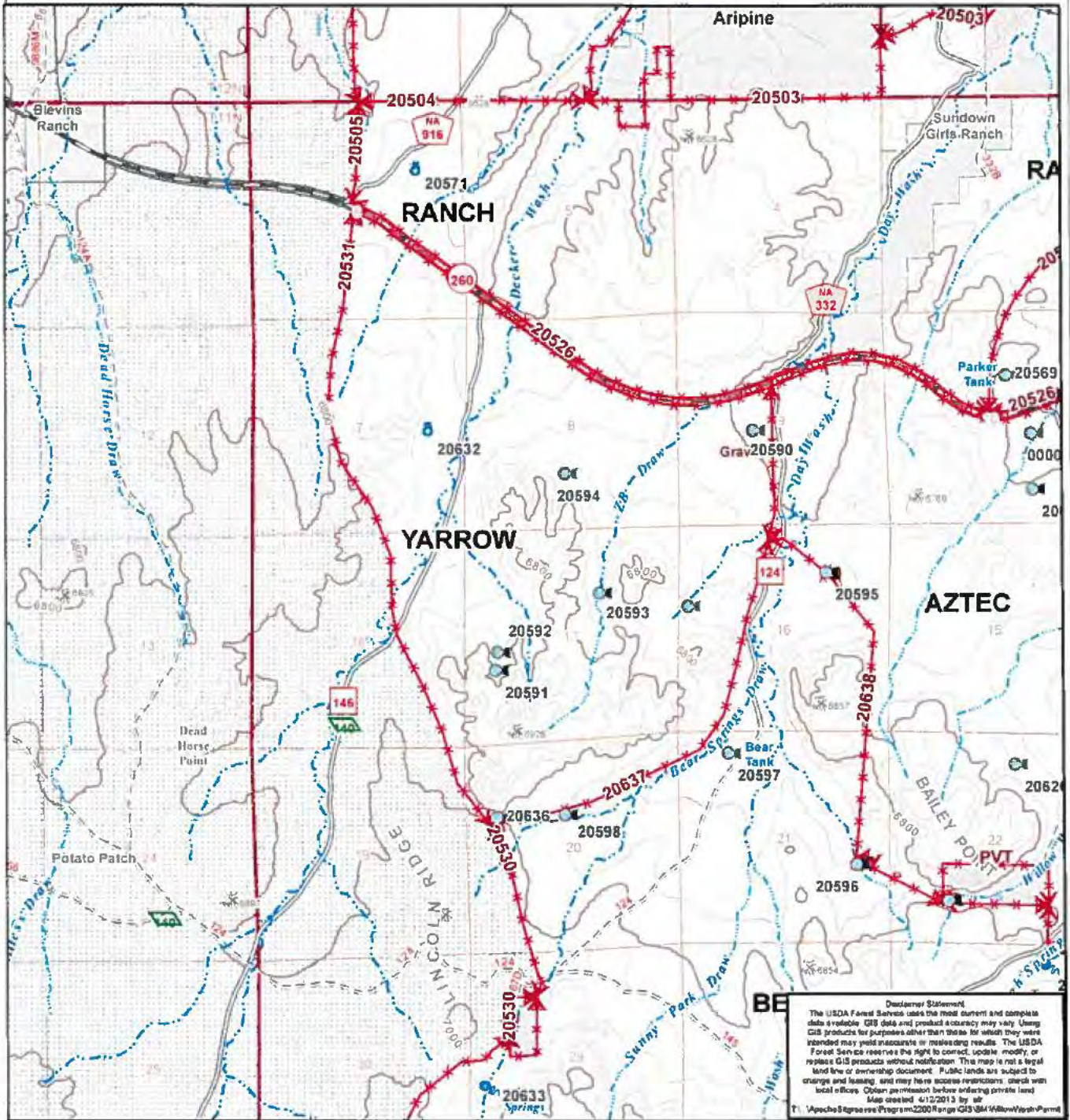
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# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: Yarrow

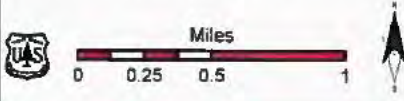


- |                 |                     |             |                          |
|-----------------|---------------------|-------------|--------------------------|
| National Forest | <b>Improvements</b> | Waterlot    | <b>Road: Maint Level</b> |
| Black Mesa RD   | Well                | Corral      | US / State Highway       |
| County Boundary | Spring              | Cattleguard | High Degree User Comfort |
| Other Allotment | Pit Tank            | Gate        | Mod Degree User Comfort  |
| Other Owner     | Trick Tank          | Fenceline   | Suitable Passenger Cars  |
| Powerline       | Trough              | Pipeline    | High Clearance Vehicles  |

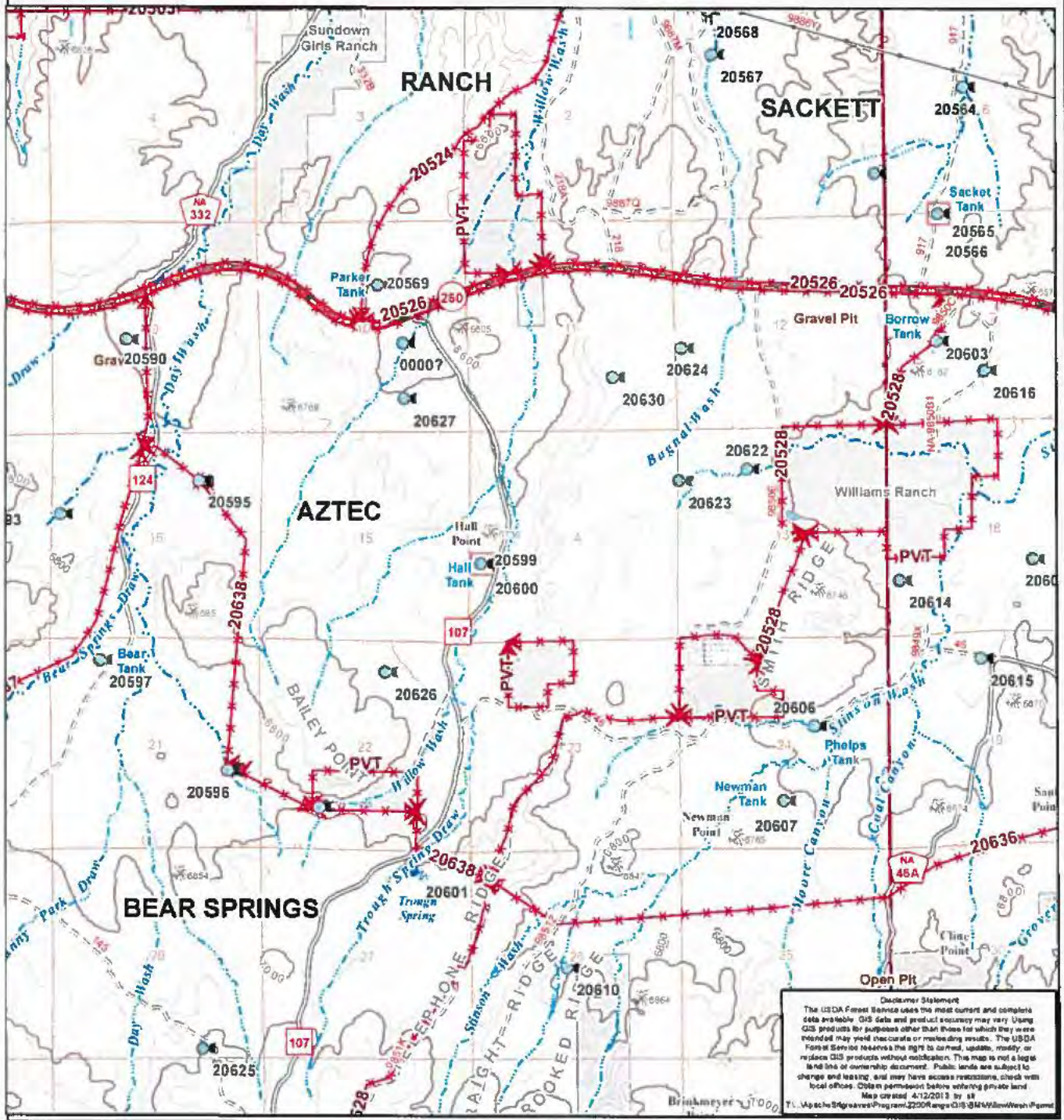


# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Aztec



- |                 |                     |             |                          |
|-----------------|---------------------|-------------|--------------------------|
| National Forest | <b>Improvements</b> | Waterlot    | <b>Road: Maint Level</b> |
| Black Mesa RD   | Well                | Corral      | US / State Highway       |
| County Boundary | Spring              | Cattleguard | High Degree User Comfort |
| Other Allotment | Pit Tank            | Gate        | Mod Degree User Comfort  |
| Other Owner     | Trick Tank          | Fenceline   | Suitable Passenger Cars  |
| Powerline       | Trough              | Pipeline    | High Clearance Vehicles  |



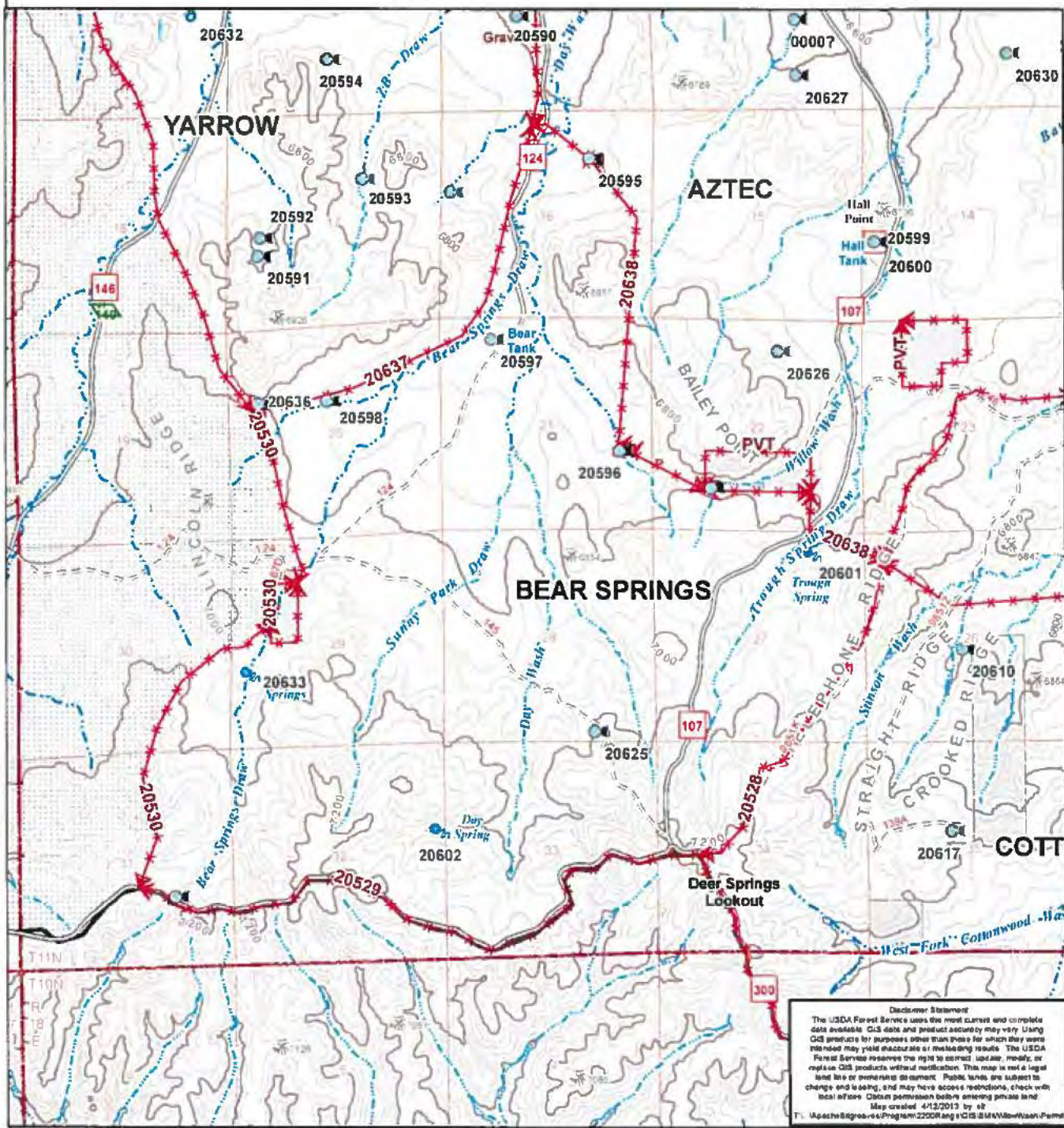
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# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Bear Springs



- |                 |                     |             |                          |
|-----------------|---------------------|-------------|--------------------------|
| National Forest | <b>Improvements</b> | Waterlot    | <b>Road: Maint Level</b> |
| Black Mesa RD   | Well                | Corral      | US / State Highway       |
| County Boundary | Spring              | Cattleguard | High Degree User Comfort |
| Other Allotment | Pit Tank            | Gate        | Mod Degree User Comfort  |
| Other Owner     | Trick Tank          | Fence/line  | Suitable Passenger Cars  |
| Powerline       | Trough              | Pipeline    | High Clearance Vehicles  |



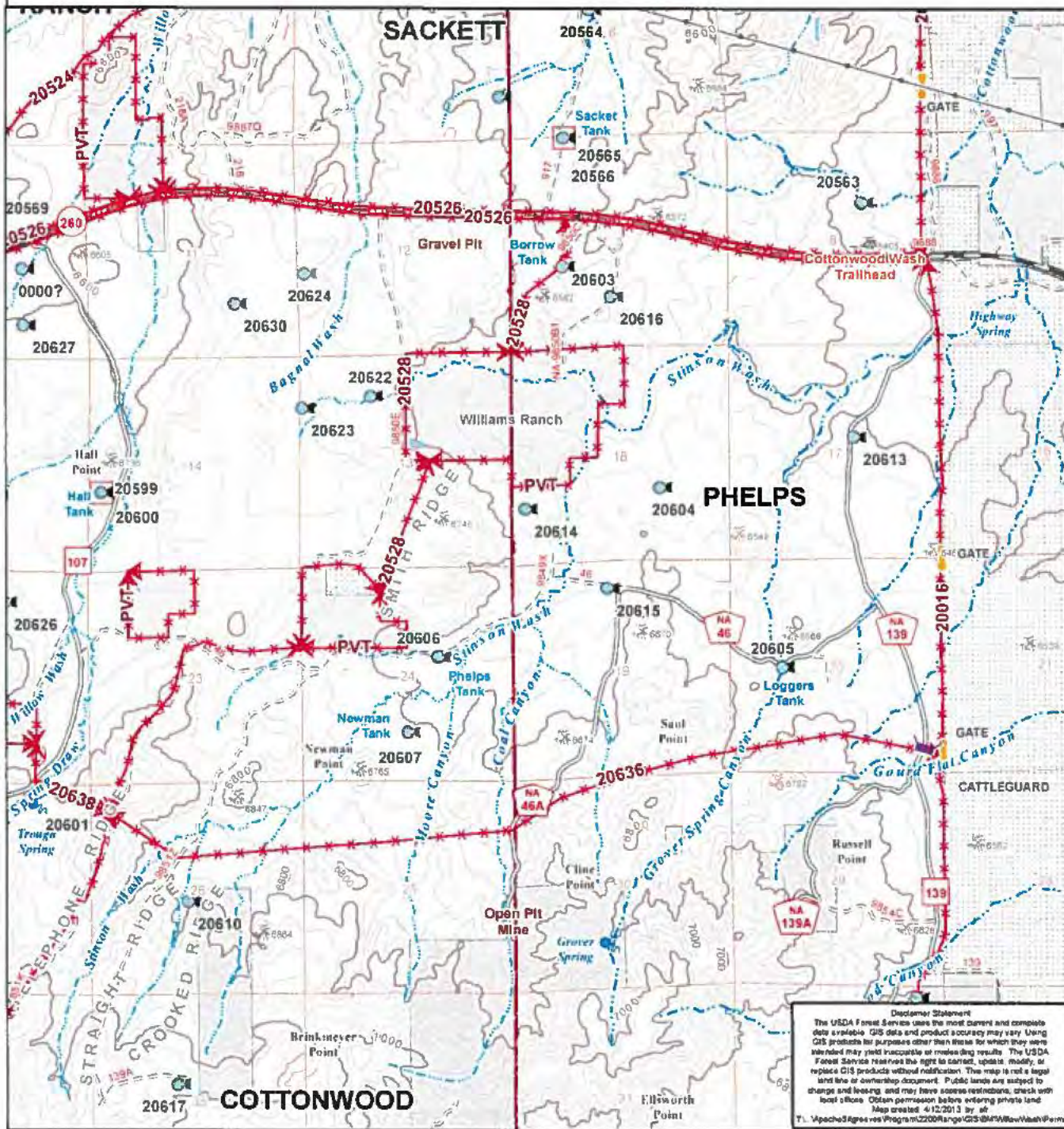
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# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Phelps



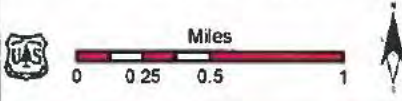
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|-----------------|---------------------|-------------|--------------------------|
| National Forest | <b>Improvements</b> | Waterlot    | <b>Road: Maint Level</b> |
| Black Mesa RD   | Well                | Corral      | US / State Highway       |
| County Boundary | Spring              | Cattleguard | High Degree User Comfort |
| Other Allotment | Pit Tank            | Gate        | Mod Degree User Comfort  |
| Other Owner     | Trick Tank          | Fenceline   | Suitable Passenger Cars  |
| Powerline       | Trough              | Pipeline    | High Clearance Vehicles  |



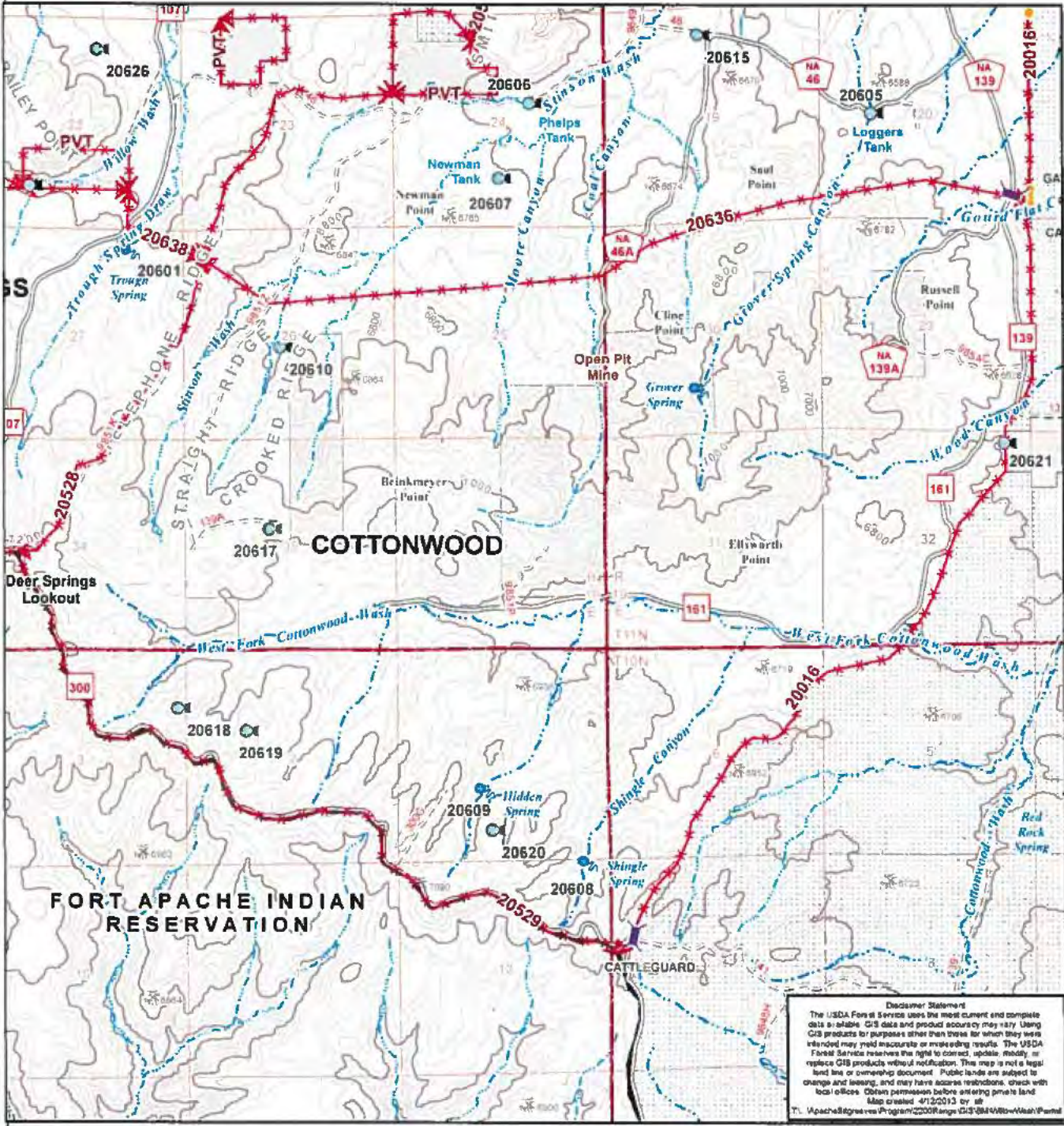
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# Willow Wash Allotment Range Improvements

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: Cottonwood



- |                 |            |             |                          |
|-----------------|------------|-------------|--------------------------|
| National Forest | Well       | Waterlot    | Road: Maint Level        |
| Black Mesa RD   | Spring     | Gorrall     | High Degree User Comfort |
| County Boundary | Pit Tank   | Cattleguard | Mod Degree User Comfort  |
| Other Allotment | Trick Tank | Gate        | Suitable Passenger Cars  |
| Other Owner     | Trough     | Fenceline   | High Clearance Vehicles  |
| Powerline       | Pipeline   |             |                          |



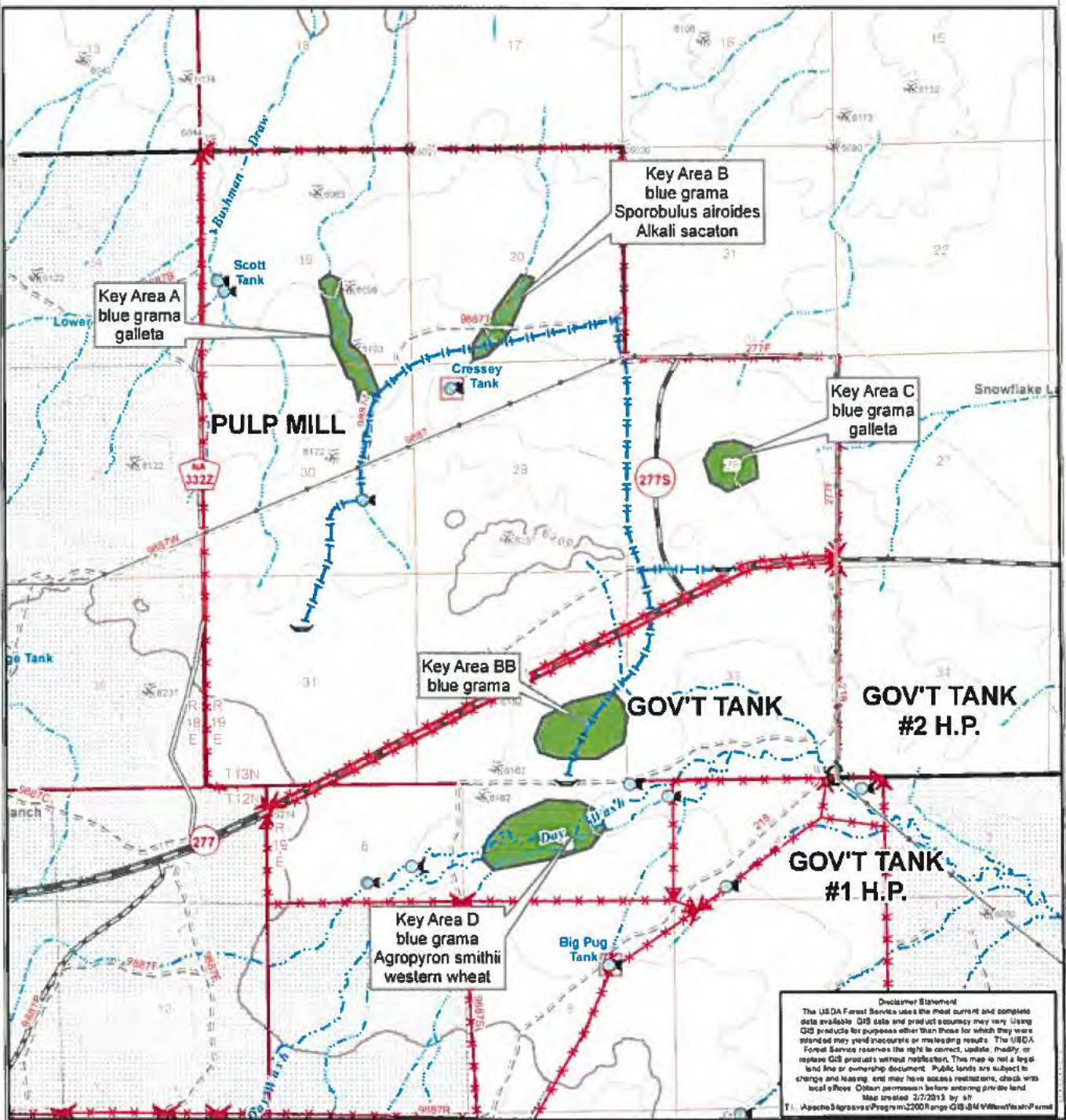
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 Map created: 4/13/2013 by: [illegible]  
 Title: Apache-Sitgreaves Program/G2200Range GIS/8844060/Map/Forest

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Pulp Mill, Gov't Tank,  
#1 HP and #2 HP



- National Forest
- Black Mesa RD
- County Boundary
- Key Area
- Other Allotment
- Other Owner
- Powerline
- Road: Maint Level
- US / State Highway
- High Degree User Comfort
- Mod Degree User Comfort
- Suitable Passenger Cars
- High Clearance Vehicles



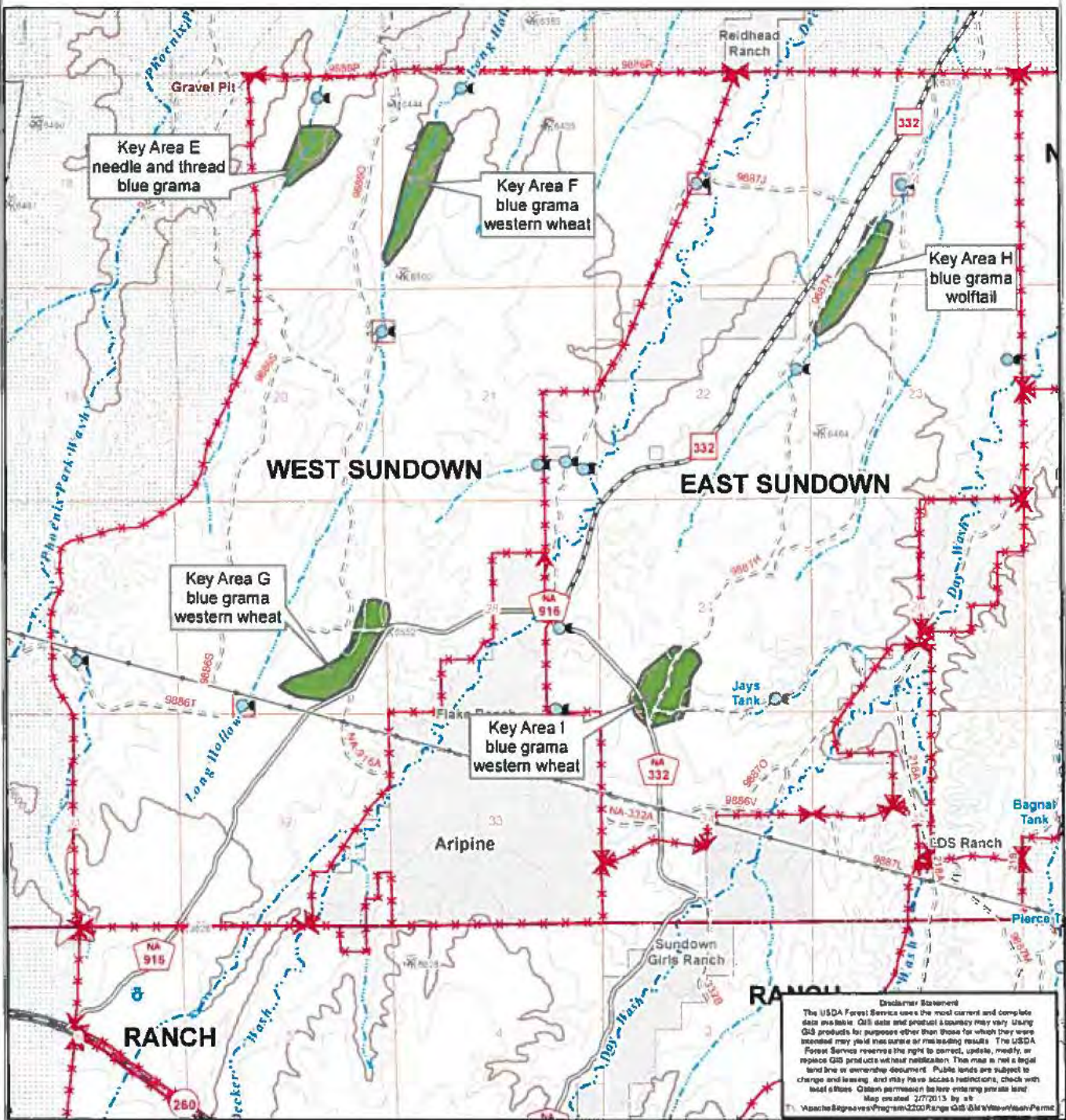
# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests

Pasture: East Sundown  
and West Sundown

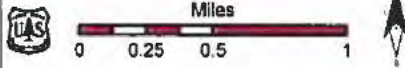


- National Forest
- Black Mesa RD
- County Boundary
- Key Area
- Other Allotment
- Other Owner
- Powerline
- Road: Maint Level
- US / State Highway
- High Degree User Comfort
- Mod Degree User Comfort
- Suitable Passenger Cars
- High Clearance Vehicles

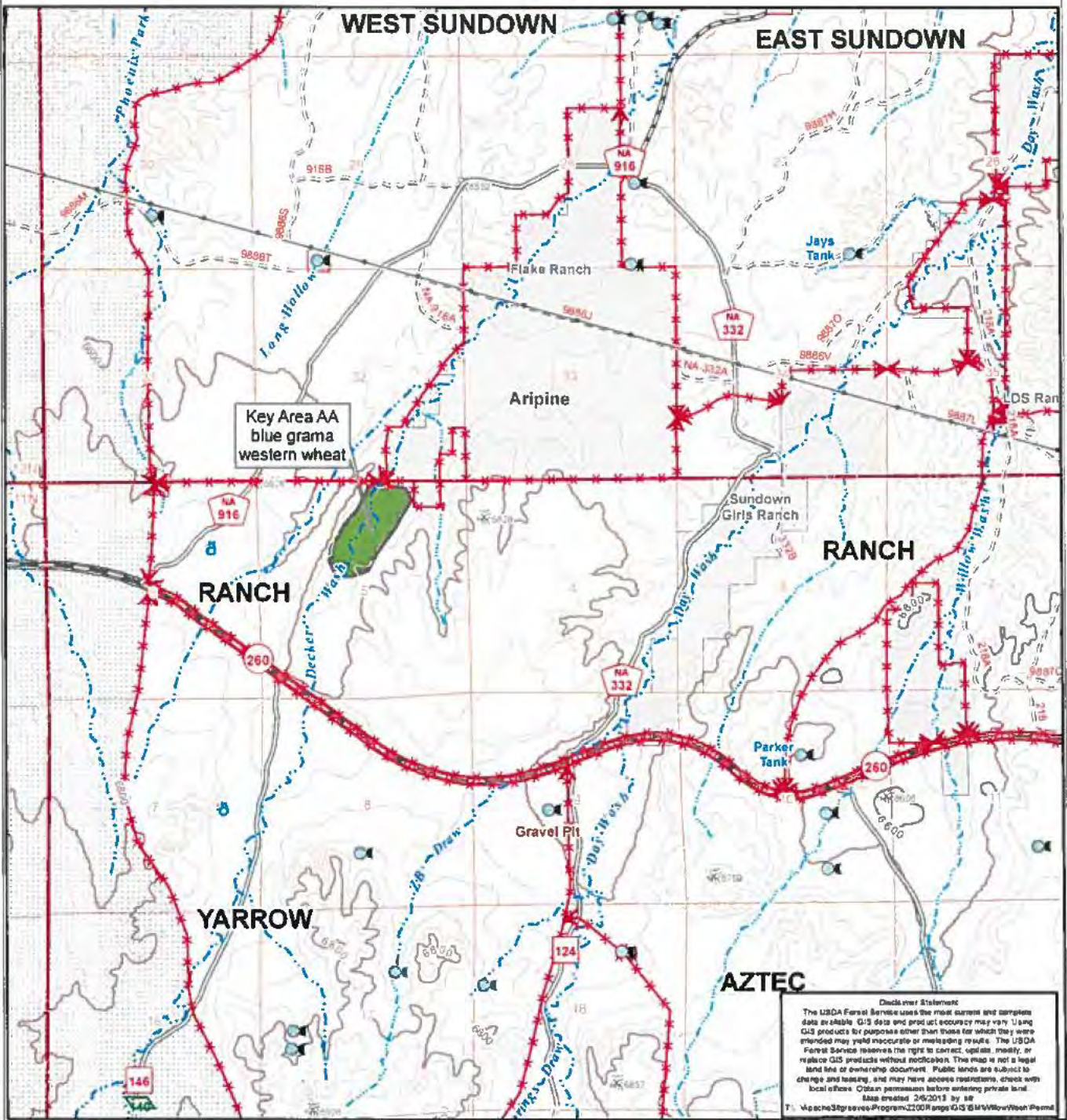


# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Ranch



- |                 |                          |
|-----------------|--------------------------|
| National Forest | Road: Maint Level        |
| Black Mesa RD   | US / State Highway       |
| County Boundary | High Degree User Comfort |
| Key Area        | Mod Degree User Comfort  |
| Other Allotment | Suitable Passenger Cars  |
| Other Owner     | High Clearance Vehicles  |
| Powerline       |                          |



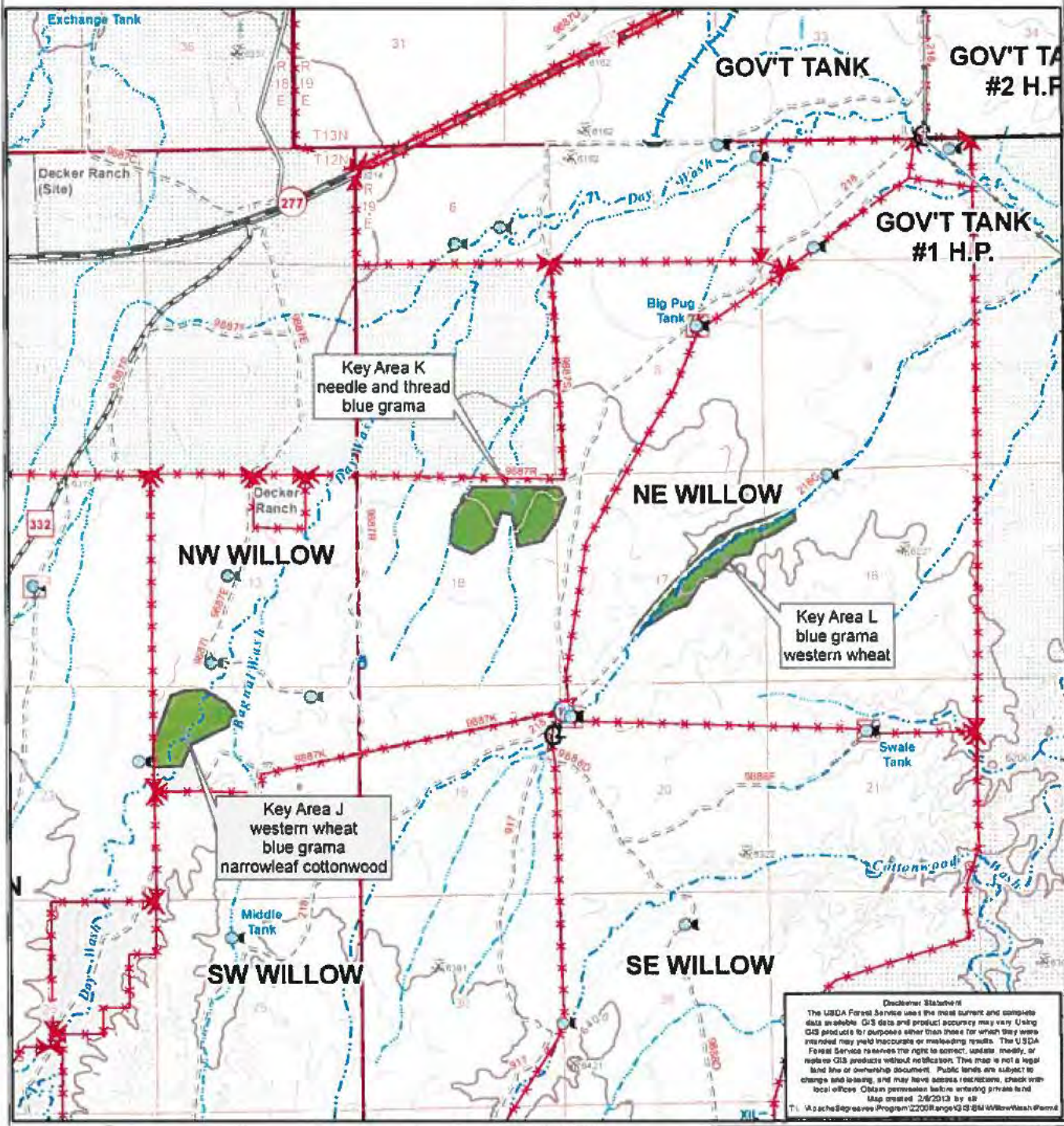
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Map created 2/6/2013 by SR  
T:\ApacheSitgreaves\Program\2200\Map\GIS\WillowWash\Map

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
 Apache-Sitgreaves National Forests  
 Pasture: NE Willow  
 and NW Willow



- National Forest
- - - Black Mesa RD
- - - - - County Boundary
- Key Area
- Other Allotment
- Other Owner
- Powerline
- Road: Maint Level
- US / State Highway
- High Degree User Comfort
- Mod Degree User Comfort
- Suitable Passenger Cars
- High Clearance Vehicles



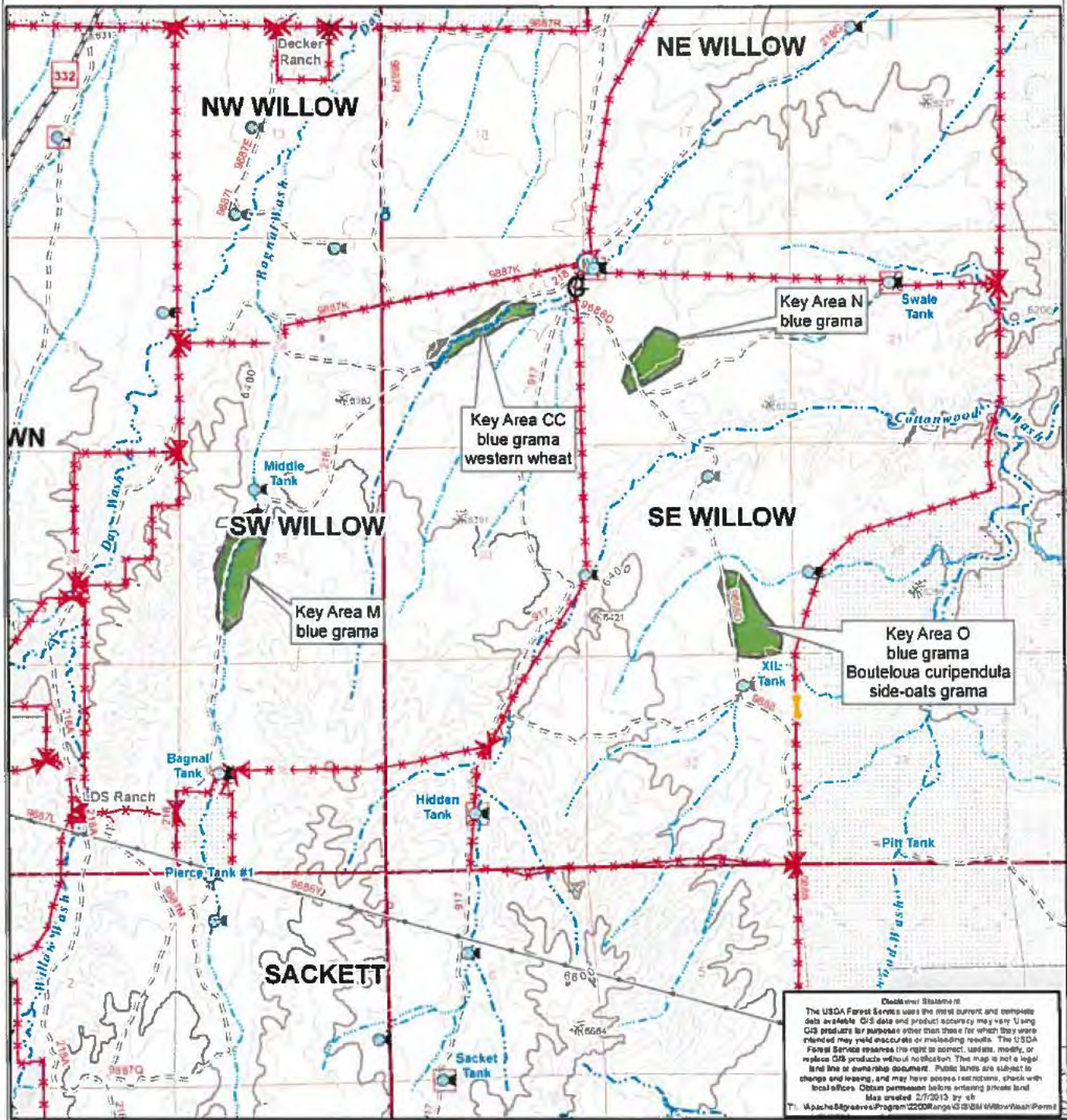
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 Map created 2/6/2013 by es  
 T. Apache-Sitgreaves National Forest (2203) Range 40 G 04 Willow Wash (P) 04

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: SE Willow  
and SW Willow



- |                 |                          |
|-----------------|--------------------------|
| National Forest | Road: Maint Level        |
| Black Mesa RD   | US / State Highway       |
| County Boundary | High Degree User Comfort |
| Key Area        | Mod Degree User Comfort  |
| Other Allotment | Suitable Passenger Cars  |
| Other Owner     | High Clearance Vehicles  |
| Powerline       |                          |



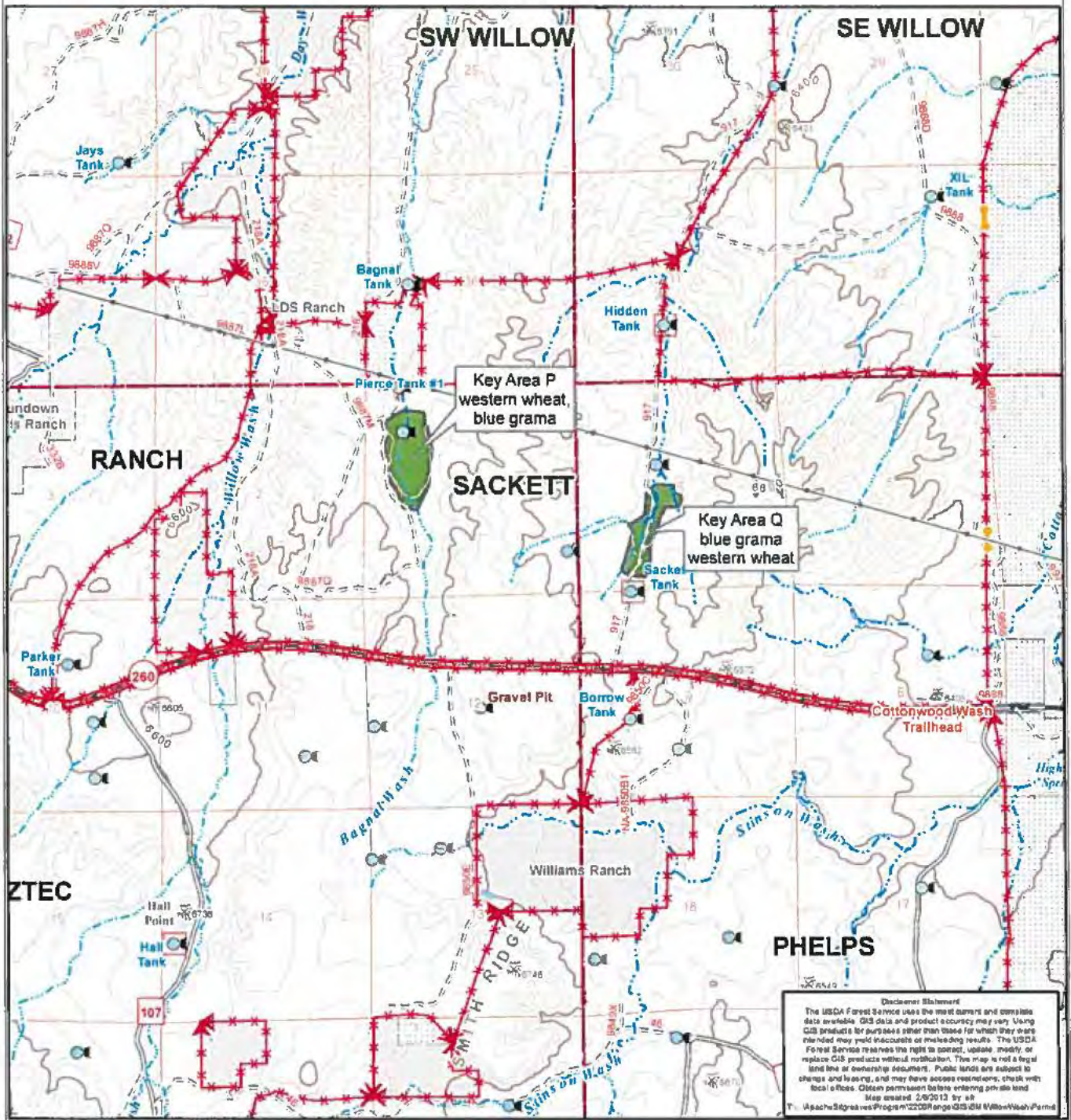
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Map created 2/7/2015 by sh  
T:\Apache-Sitgreaves\Program\2200Range\GIS\SW Willow\Willow\Permit

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Sackett



- |                 |                          |
|-----------------|--------------------------|
| National Forest | Road: Maint Level        |
| Black Mesa RD   | US / State Highway       |
| County Boundary | High Degree User Comfort |
| Key Area        | Mod Degree User Comfort  |
| Other Allotment | Suitable Passenger Cars  |
| Other Owner     | High Clearance Vehicles  |
| Powerline       |                          |



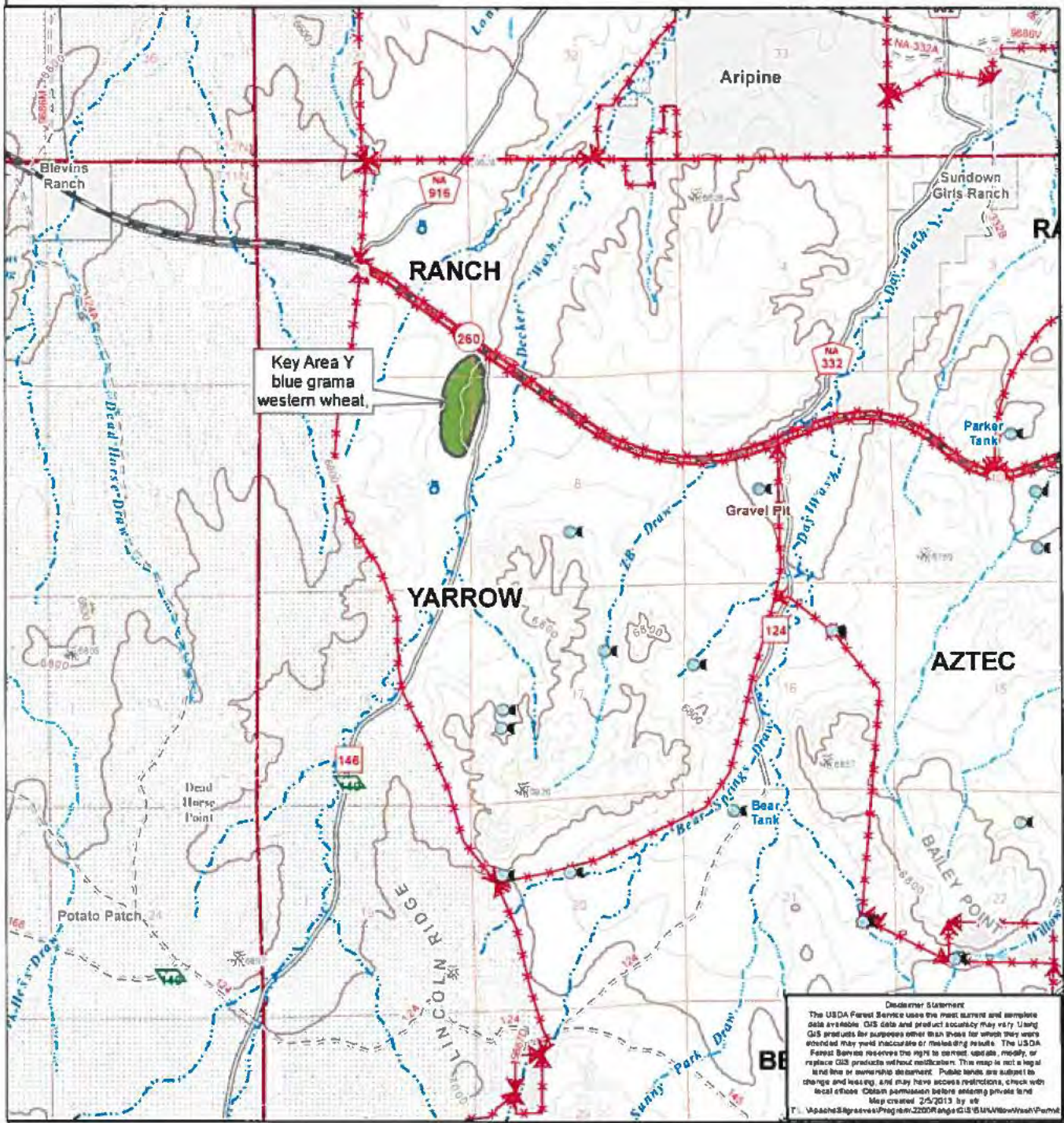
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Map created 2/8/2012 by sh  
Apache-Sitgreaves Program 22039 Range GIS 05 Willow Wash Parks

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Yarrow



- National Forest
- Black Mesa RD
- County Boundary
- Key Area
- Other Allotment
- Other Owner
- Powerline
- Road: Maint Level
- US / State Highway
- High Degree User Comfort
- Mod Degree User Comfort
- Suitable Passenger Cars
- High Clearance Vehicles



Key Area Y  
blue grama  
western wheat

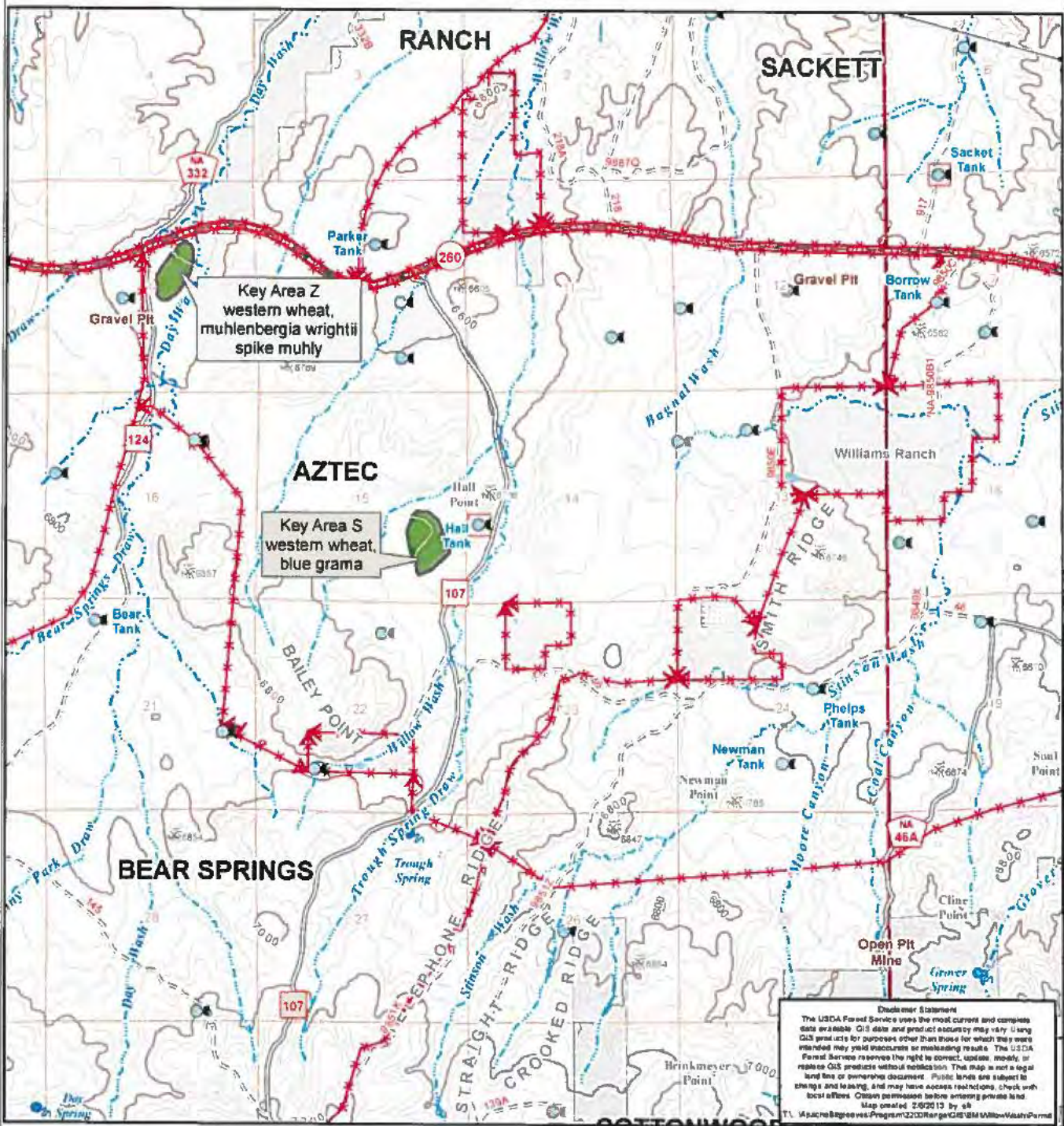
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Map created 2/5/2013 by vlt  
T. V. Apache-Sitgreaves Program 2200Ranga GIS/USDA/Willow Wash/Permit

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Aztec



- National Forest
- Black Mesa RD
- County Boundary
- Key Area
- Other Allotment
- Other Owner
- Powerline
- Road: Maint Level
- US / State Highway
- High Degree User Comfort
- Mod Degree User Comfort
- Suitable Passenger Cars
- High Clearance Vehicles



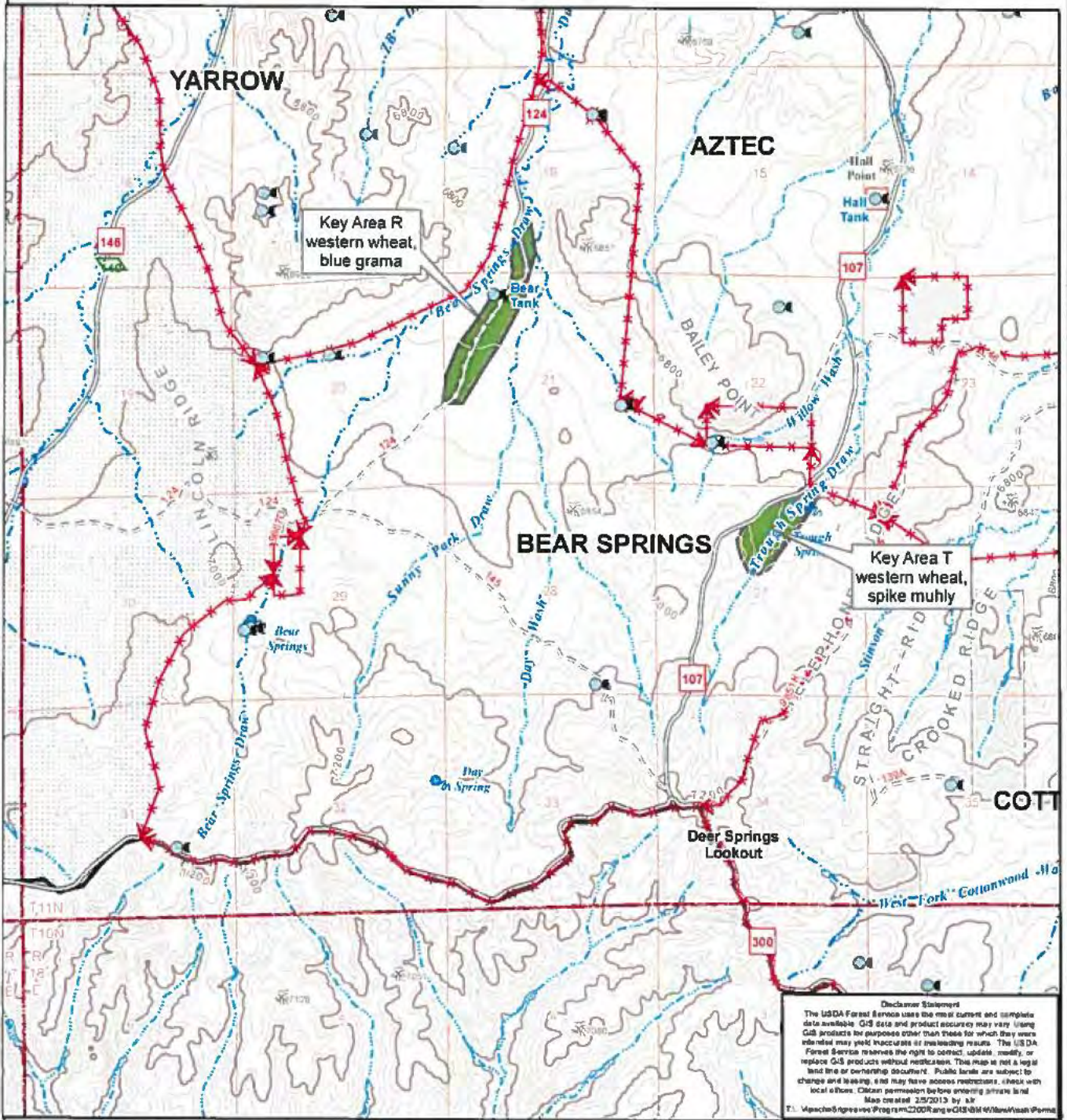
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Map created 2/2013 by JLS  
T:\Apache-Sitgreaves\Program\GIS\RM\Willow-Wash\Permd

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Bear Springs



- National Forest
- Black Mesa RD
- County Boundary
- Key Area
- Other Allotment
- Other Owner
- Powerline
- Road: Maint Level
- US / State Highway
- High Degree User Comfort
- Mod Degree User Comfort
- Suitable Passenger Cars
- High Clearance Vehicles



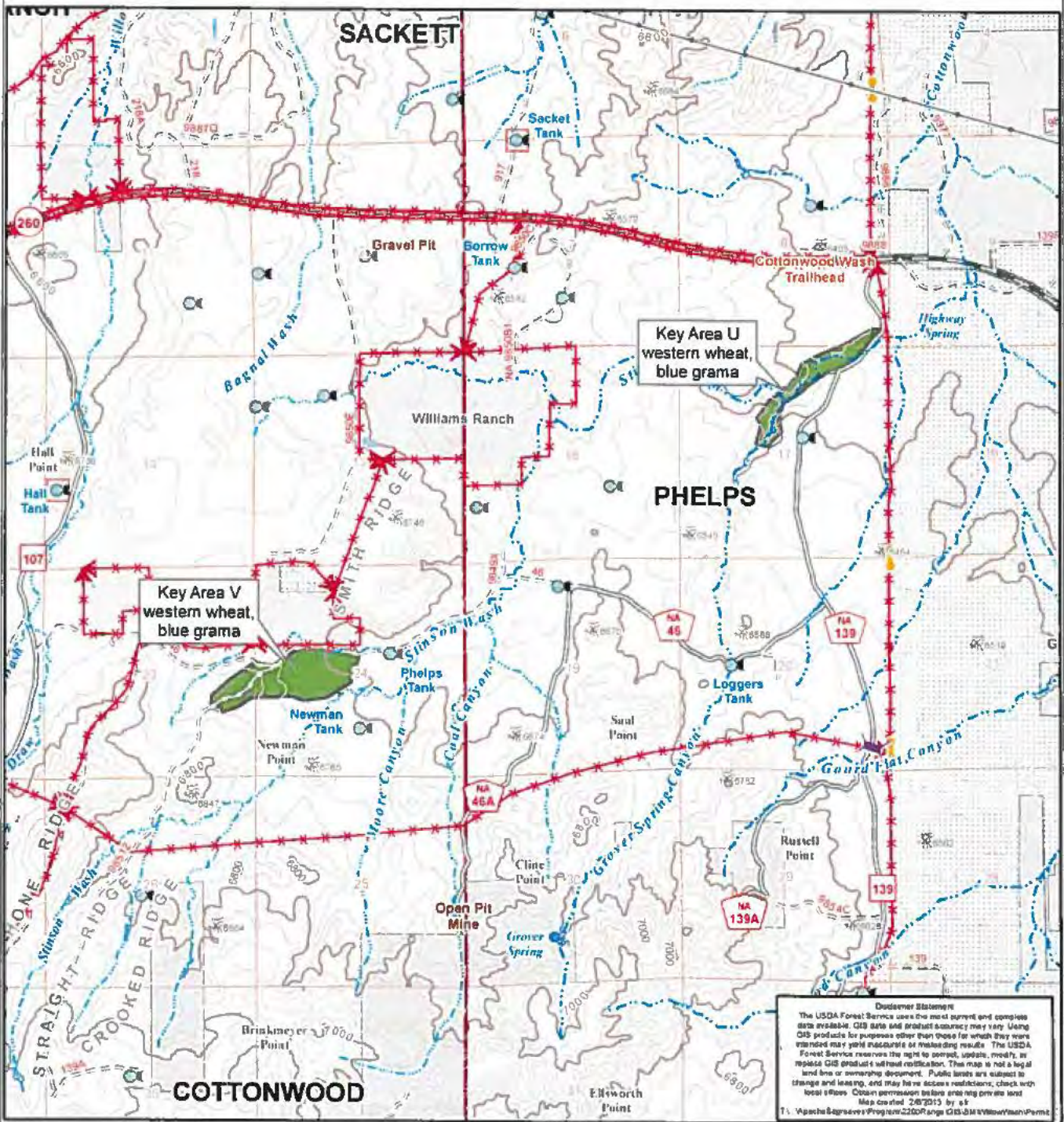
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Map created 2/5/2013 by air  
T:\Apache-Sitgreaves\Programs\2008RangeGIS\BIM\WillowWash\Forms

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Phelps



- National Forest
- Black Mesa RD
- County Boundary
- Key Area
- Other Allotment
- Other Owner
- Powerline
- Road: Maint Level
- US / State Highway
- High Degree User Comfort
- Mod Degree User Comfort
- Suitable Passenger Cars
- High Clearance Vehicles



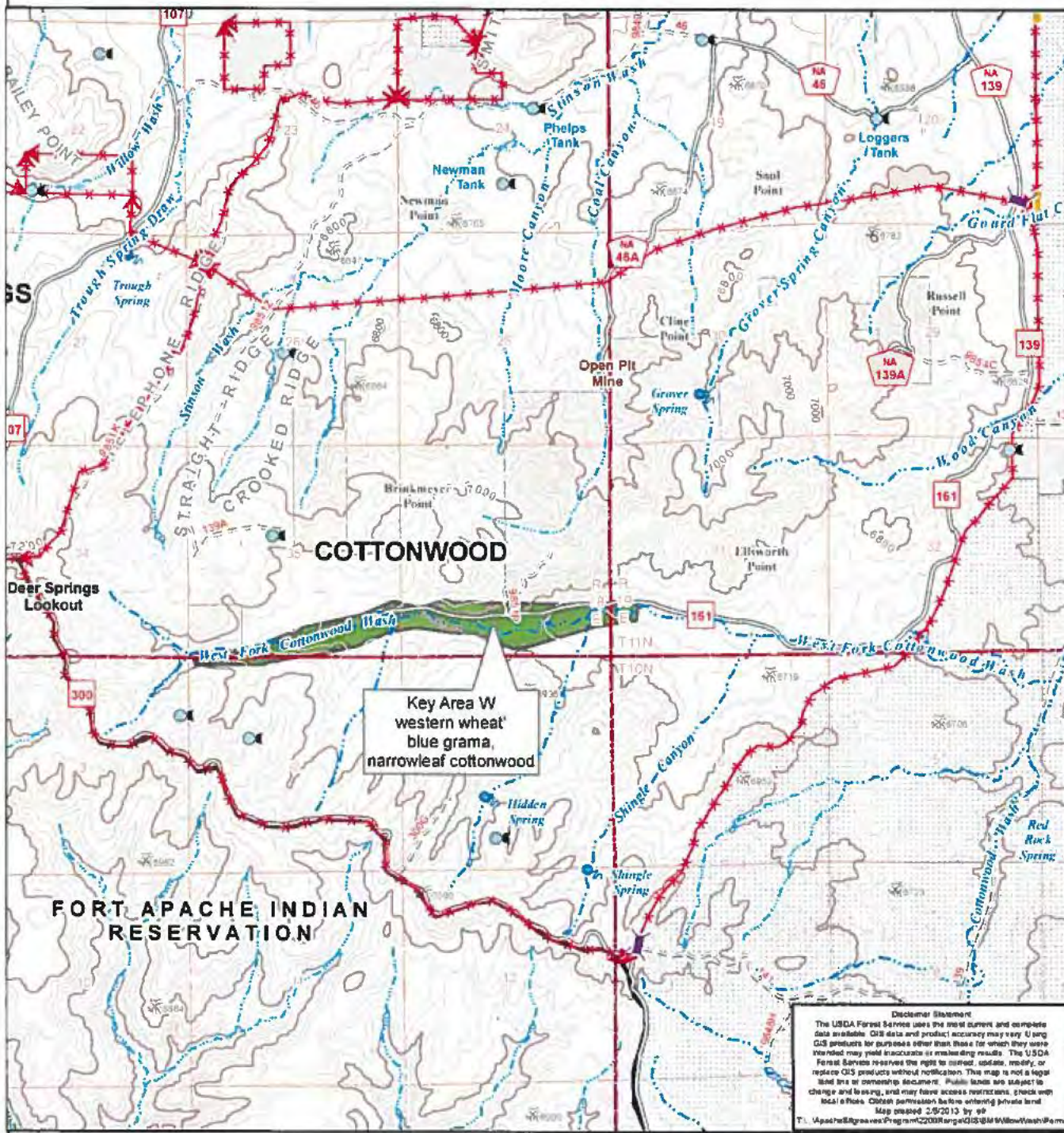
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T1: Apache-Sitgreaves Program 22007 range GIS-BM Willow/Wash/Perm

# Willow Wash Allotment Key Areas

Black Mesa Ranger District  
Apache-Sitgreaves National Forests  
Pasture: Cottonwood



- National Forest
- Black Mesa RD
- County Boundary
- Key Area
- Other Allotment
- Other Owner
- Powerline
- Road: Maint Level
- US / State Highway
- High Degree User Comfort
- Mod Degree User Comfort
- Suitable Passenger Cars
- High Clearance Vehicles



Key Area W  
western wheat  
blue grama,  
narrowleaf cottonwood

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T. Apache-Sitgreaves Program/C200RangerGIS@MWillowWash@msd



**Willow Wash Allotment**  
**Black Mesa R.D.**  
**Apache-Sitgreaves N.F.s**  
**Allotment & Pasture Boundaries**



**Legend**

- Forest Boundary
- State Highway
- Allotment Boundary
- Other Owner
- Pasture Boundary



Map created January 18, 2013 by str  
 T:\SUNF\ApacheSagres\Program\2200Rangel  
 GIS\B\WillowWash\mxd  
 Saved as  
 Land Line Locations Area Approximate  
 Projected Coordinate System: NAD 1983 UTM Zone 12N

