

Arizona National Forest Cave and  
Karst Management Week  
September 22-25, 2014

**Arizona National Forests  
Cave and Karst Management Guides**

**Wouldn't It Be Nice ...**

Ray Keeler  
Central Arizona Grotto  
National Speleological Society

It appears there are five stakeholder groups impacting caves and karst:

- Forest Managers and Specialists
- Researchers
- Participants helping with the cave and karst
- Recreationalists using the resource
- For profit companies that impact the resource

# Wouldn't It Be Nice: If the Forest had a document that:

- **Lists and uses as the strategies:**

- The laws (authorities)
- The Code of Federal Regulations (CFRs)
- Forest Service Manual (FSM)

- **Includes the “how to” guidelines for cave and karst management for both:**

- Field management (surface and in-cave)
- File management (public and restricted)
- Significant Cave Nomination

- **Includes cave research criteria including:**

- Proposals
- Ethics
- Methodology guidelines
- Deliverables
- ... and then included some categories where it would be nice to have research

# Wouldn't It Be Nice: If the Forest had a document that:

- **Includes Caving Ethics For**

- Forest Service personnel (for those new to caves)
- Recreationalists
- Researchers

- **Includes Guidelines for “For Profit” resource management**

- To mitigate impact to the cave and karst resource
- To mitigate *unnecessary* impact to the cave and karst resource
- (more on this later)

- **Includes Guidelines for Caver participants**

- To help the Forest personnel
- To better understand the requirements used by the Forest

## Wouldn't It Be Nice:

If each Forest has the same strategic documentation for caves and karst, but the document also includes references for that Forest's specific items ...

...and leaves out areas that are not on that Forest

# Wouldn't It Be Nice:

## For example:

Some forests have significant caves *and karst*:

Apache-Sitgreaves, Coconino, Kaibab, Tonto

Some forests have significant caves, but little karst:

Coronado, Prescott, Cibola (NM)

Why include a lot of karst management when entrance buffer management is needed?

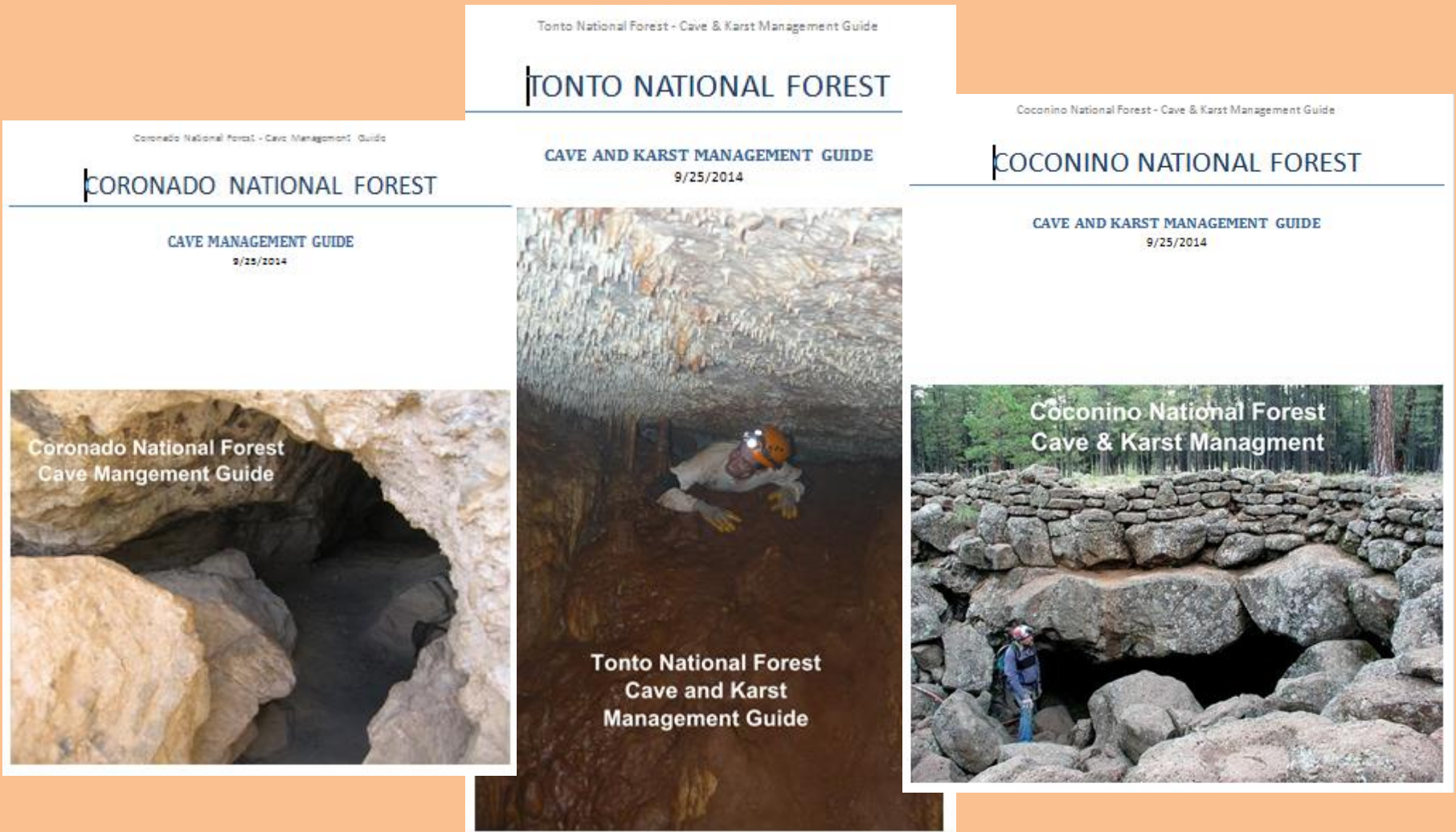
## Wouldn't It Be Nice:

If the Forest Service personnel could transfer anywhere in Region 3, and know they had *similar* guidelines for how to manage the cave and karst resources

Ahhh ... see the weasel word? ... *similar*

# Wouldn't It Be Nice:

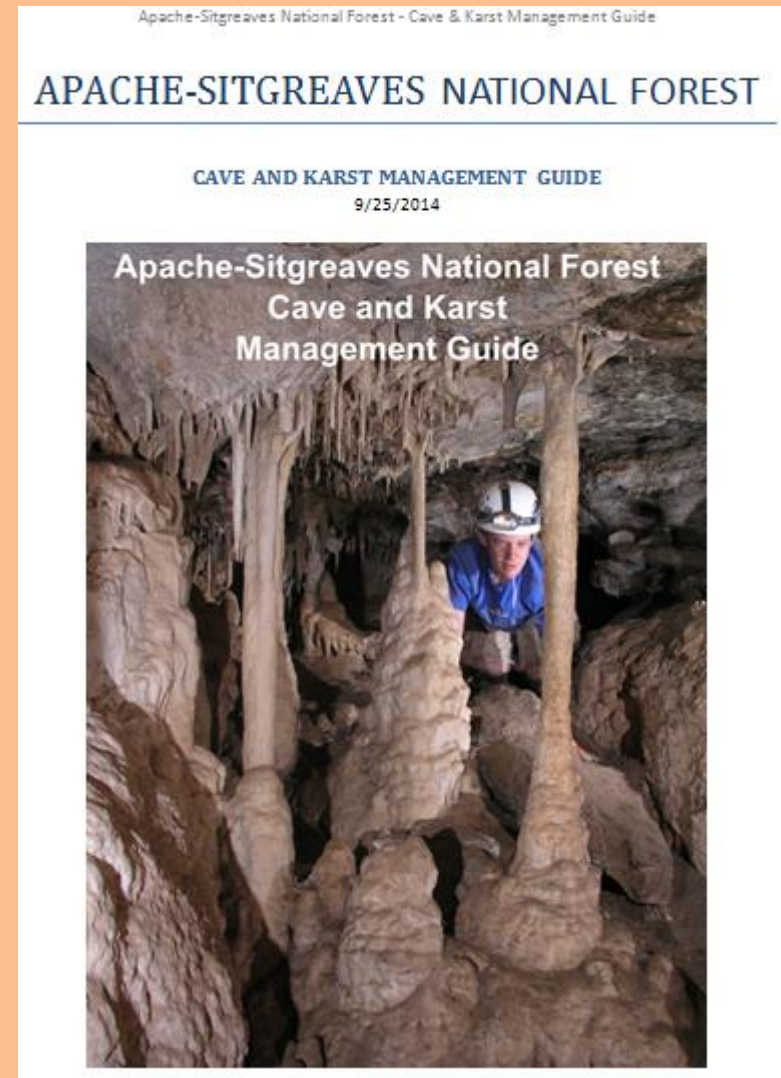
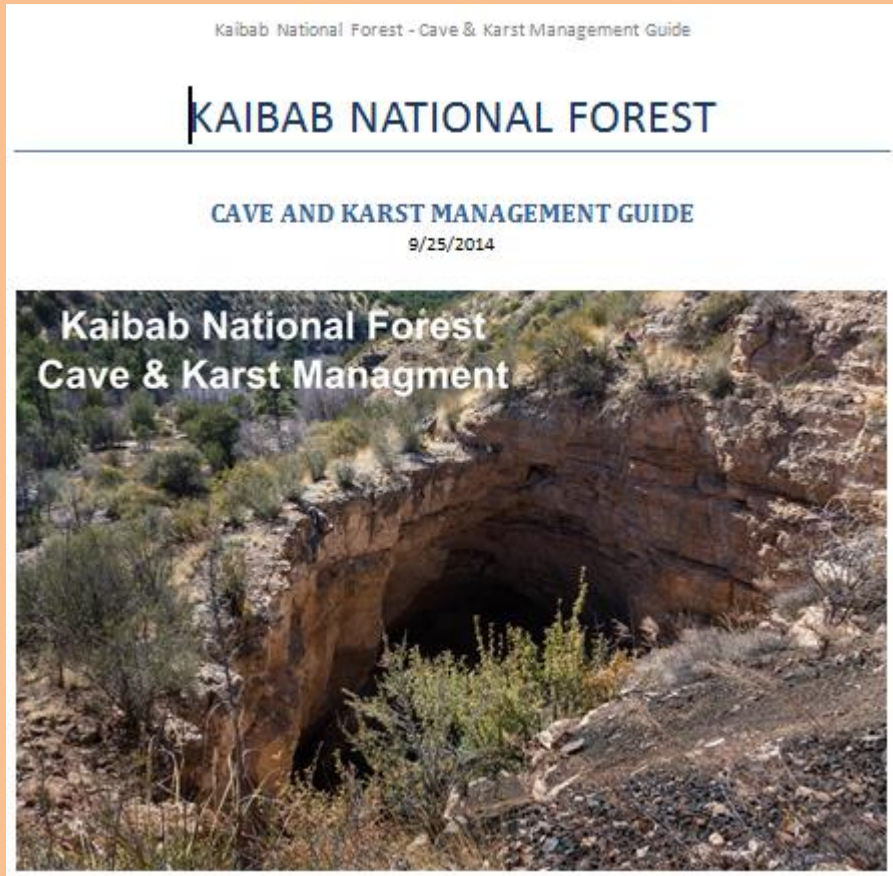
Following documents now exist as a starting point:





# Wouldn't It Be Nice:

... and a couple more documents:



**Wouldn't It Be Nice:**

**So What is in the Document?**

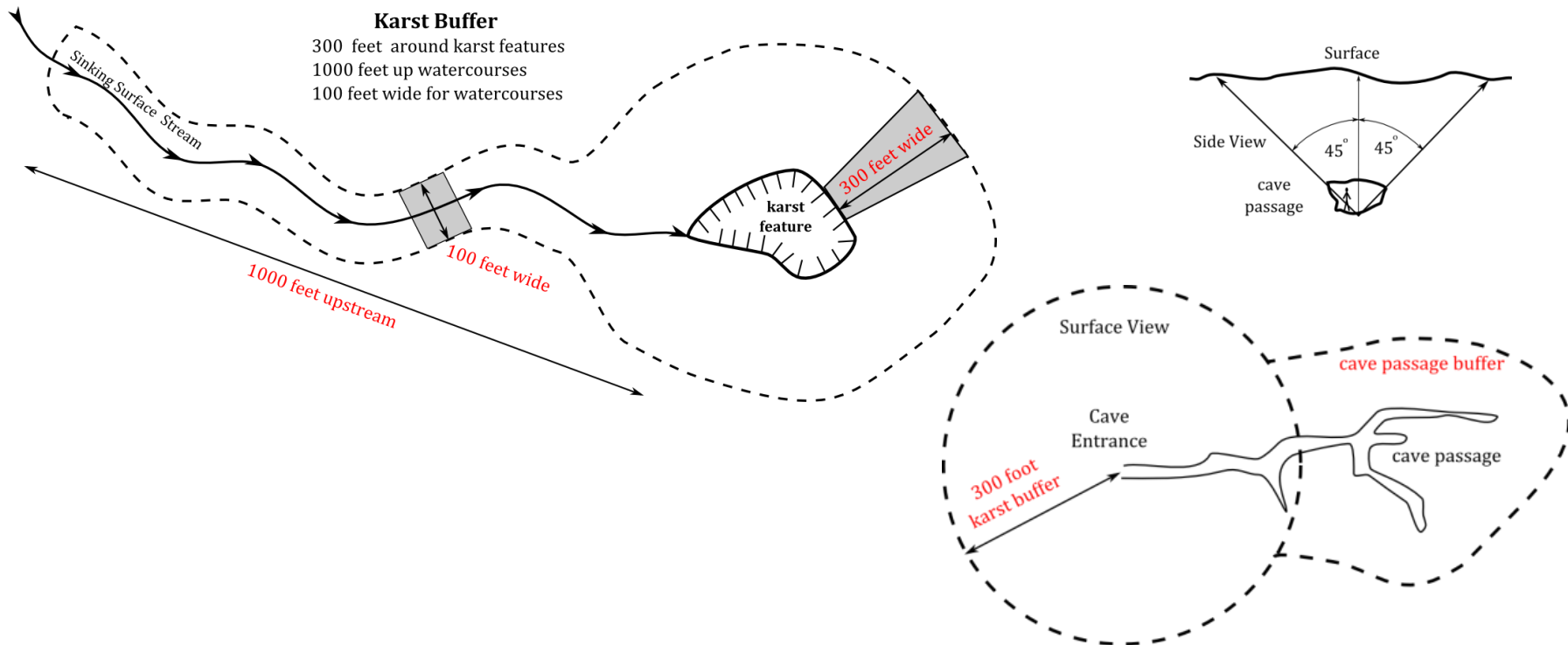
# ARIZONA NATIONAL FOREST

## CAVE & KARST MANAGEMENT GUIDE

- Uses the Code of Federal Regulations as the requirements. (strategic)
- Provides the line personnel a format for cave and karst management (tactical)
- Provides surface karst management guidelines that are compatible with existing forest policies
- Gives a framework for volunteers to help

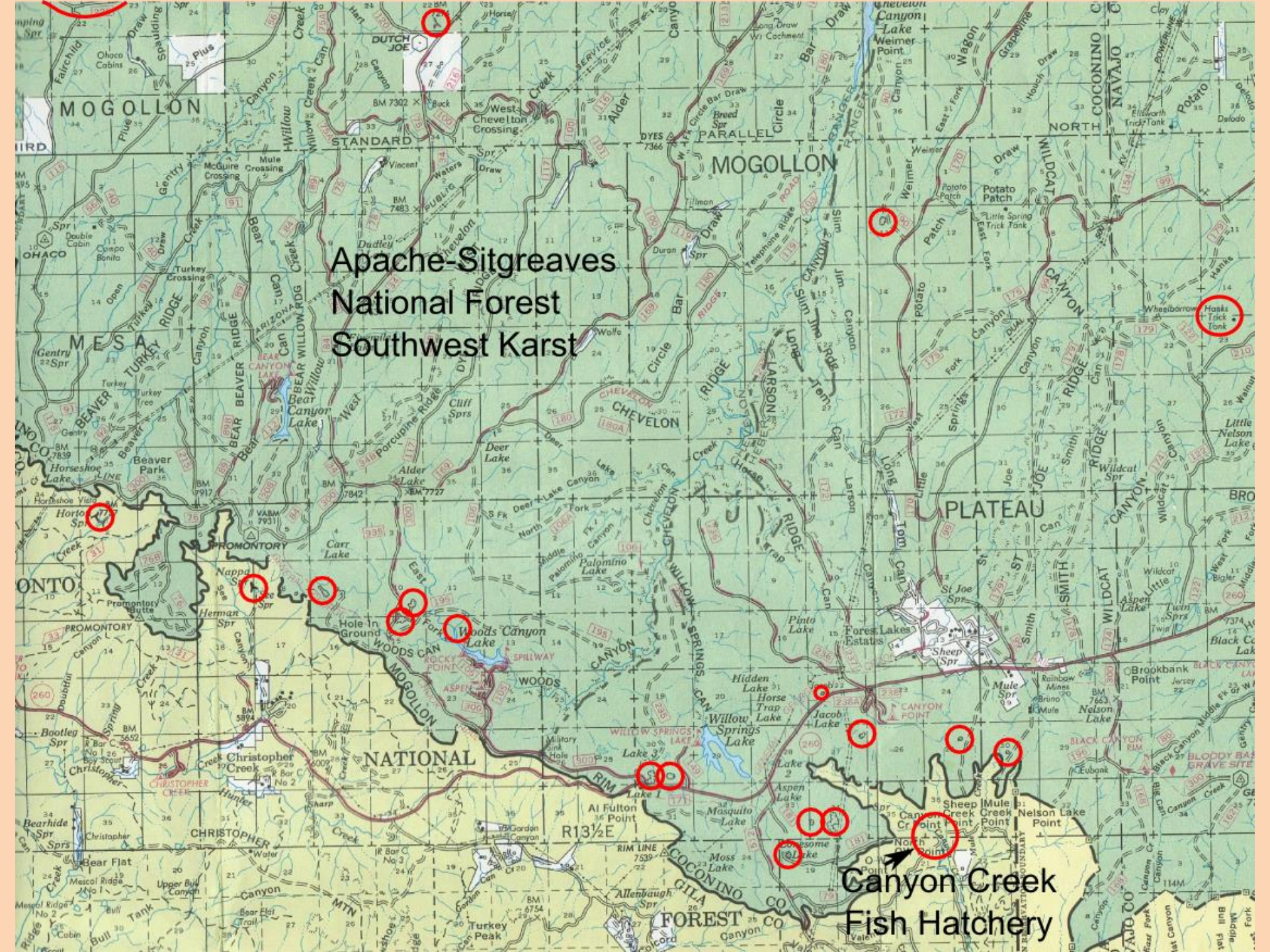
# Three karst surface number guidelines:

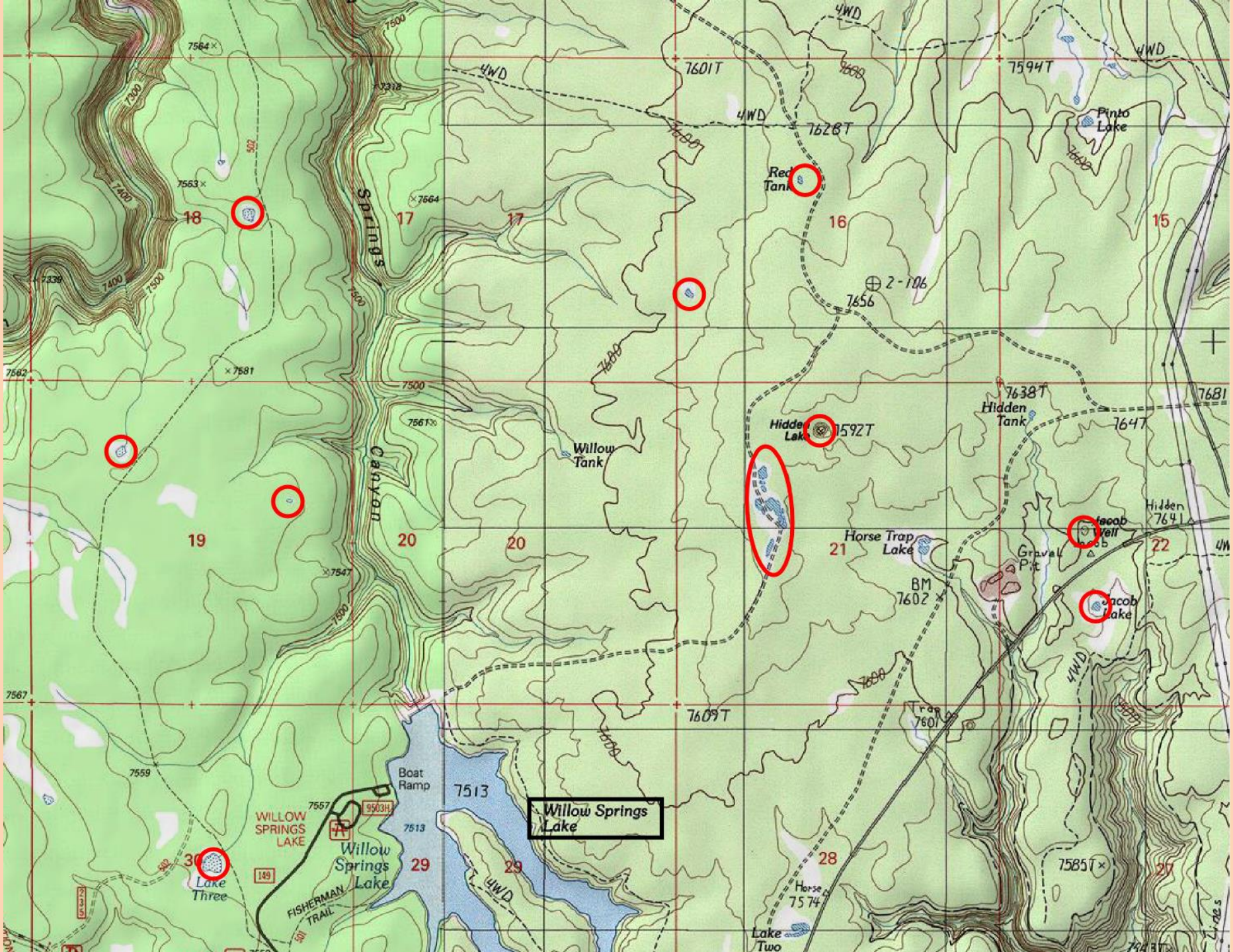
- 300 foot buffer around karst features
- 100 foot water course buffers for
- 1000 feet upstream

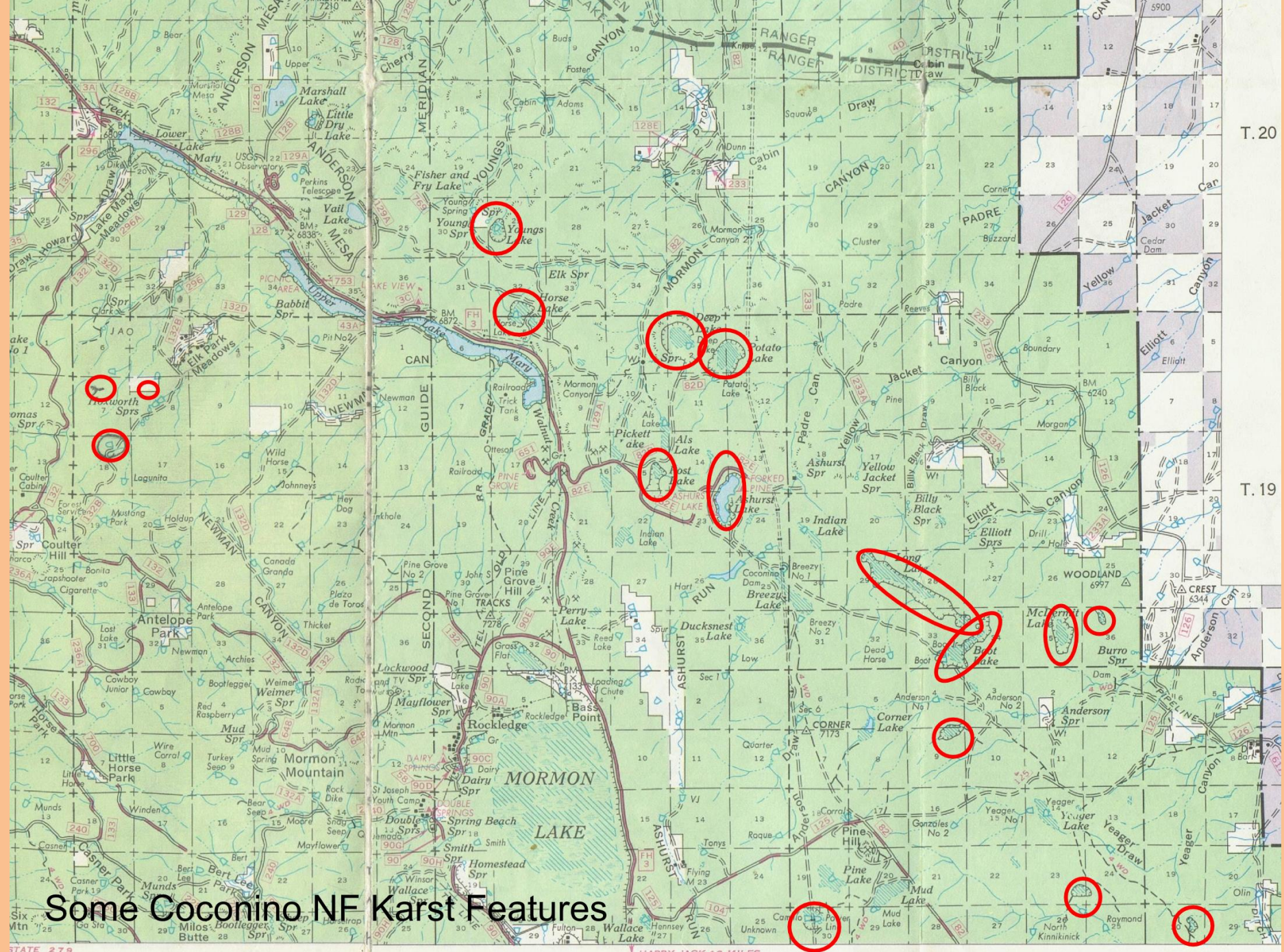


Apache-Sitgreaves  
National Forest  
Southwest Karst

Canyon Creek  
Fish Hatchery







T.20

T.19

Some Coconino NF Karst Features

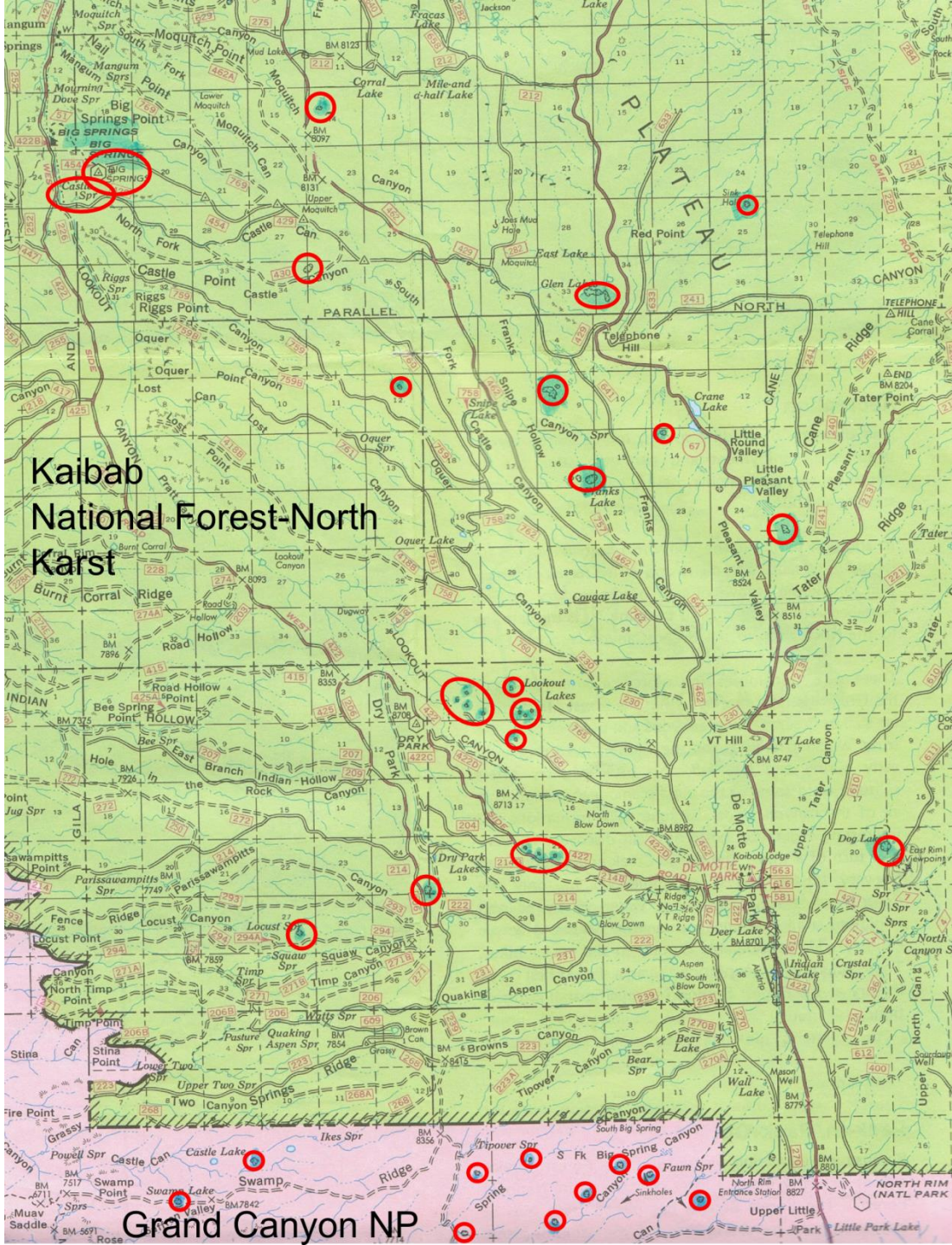
R.8.E.

R.9.E.

R.10.E.

Kaibab  
National Forest-North  
Karst

Grand Canyon NP





map

Traffic



89A

89A

89A

89

89

89

67

67

67

64

64

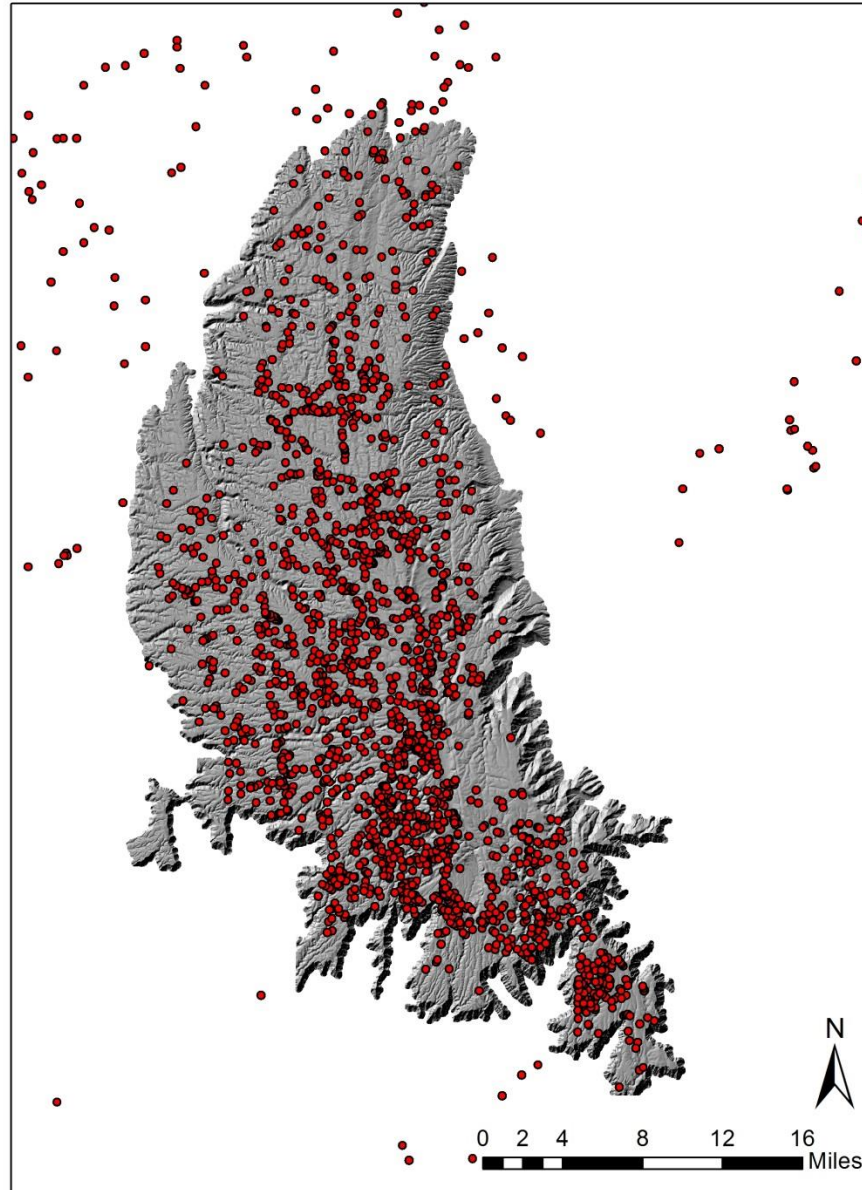
Kaibab Plateau HP

Grand Canyon National Park

Grand Canyon Village

5 mi  
10 km

# Kaibab Plateau Karst Features



# The Forest Cave Management Guide lists:

- Authorities (FCRPA and CFRs)
- Cave Evaluation and rating criteria (standardized rating criteria)
- Cave Classification for associated management guidelines
- Caving ethics - practical training for both Forest personnel and the general public
- Public Involvement
- Research proposal guidelines
- Inventory procedures
- Monitoring categories
- Permits and user limits
- File Management – Public and Protected file content and access
- Supports individual cave management plans

# Bookmarks To Help Get Around

[Hyperlinks](#) are in [blue bold](#) to allow easier access between the policies and the implementation techniques.

## [C. EVALUATION AND RATING](#) RESOURCES

Each [cave's classification](#) and overall management is determined by the cave's resource category and class evaluation. The management categories provide the ability to compare cave resources on a Forest-wide basis, and identify caves requiring priority management.

A relative system for evaluating cave resources on the forest is presented in [Appendix D – Cave Evaluation and Rating Guidelines](#). These rating guidelines are inputs for Significant Cave nominations, located in [Appendix E – Significant Cave Designation Process](#). The Significant Cave Designation Process lists the criteria needed to become a significant cave. The [SIGNIFICANT CAVE NOMINATION WORKSHEET](#) lists the information needed to help with the evaluation. [Appendix F - General Inventory Procedures](#) lists additional areas to be considered when conducting the inventory. Values are rated in three categories; low, moderate, high. A resource is usually assigned the rating which best describes it.

# Cave Classifications

- **Category 1: Generally Known Caves**
  - CLASS 1 – Highly Developed (none in Arizona forests)
  - CLASS 2 – Developed Natural (Lava River Cave)
  - CLASS 3 – Natural (Pivot Rock Springs)
  
- **Category 2: Lesser Known Caves**
  - CLASS 4 – Primitive
  - CLASS 5 – Sensitive and Pristine Caves

# Cave Classifications – Category 1

## Category 1 – Generally Known Caves

Information on Generally Known Caves is available through the greeting personnel at the Forest and District offices.

### Class 1 – Highly Developed Caves

There are no Highly Developed Caves currently in Coconino NF. These are directed access caves with public access. Portions of the cave are developed for public use. These caves are shown on maps or have signs directing visitor access. These caves also may have guided tours and artificial lighting. Regardless of the level of development, encourage public visitation. The caves may have sensitive resources that are protected. Cave management prescriptions are required. There are no caves in this classification on the Coconino National Forest at this time.

### Class 2 – Developed Natural

These are caves with public access. These caves are undeveloped, but are suitable for exploration by persons who are properly prepared. In general, these caves contain resources that resist degradation by moderate levels of recreational use. General public visitation is significant. Cave management prescriptions are required. A permit is not required.

### Class 3 – Natural Caves

These are caves that are in common knowledge but are visited by more physically-fit persons do to the more strenuous aspects of traversing the cave, or a more strenuous approach to the cave entrance. The caves may be more physically challenging. The caves are undeveloped but are suitable for exploration by persons who are properly prepared. In general, these caves contain resources that resist degradation by moderate levels of recreational use. Public attention will not be directed toward these caves. They will neither be shown on maps nor discussed in brochures or publications intended for general public distribution. A permit may be required.

# Cave Classifications – Category 1

## Category 2 – Lesser Known Caves

Information on Lesser Known Caves is primarily through the Forest or District cave responsible officer. Additional support and information may be available through caving organizations in coordination with the USFS personnel.

### Class 4 – Primitive Caves

Resources are generally in a good or better condition. Caves in this class are not developed. Visitors must provide all necessary equipment required to safely explore the cave. Technical skills (such as rock climbing) may be required. A visitor has a good chance of experiencing risk and self-sufficiency through the application of caving skills. Visitor registers with conservation messages are likely to be installed just within the entrance, but other management devices will not be installed unless their use is warranted by the presence of fragile resources or extreme hazards. Social interactions are usually between members of a small group of experienced recreational cavers. Social encounters with other groups are very rare because visitation is very low or regulated.

### Class 5 – Sensitive and Pristine Caves

Resources show no or very little alteration caused by human activity. Most, or all, of the formations are not broken or marred. Introduced dust and mud is limited to established travel routes. Traffic patterns have also been limited to reduce floor destruction. Caves in this class are not developed. Visitors must provide all necessary equipment required for safe exploration. Technical skills (such as rock climbing) may be required, and there is usually an opportunity to experience risk and self-sufficiency. Social interactions are typically between members of a small group of experienced cavers. Visitor encounters with other groups are very rare because visitation is low or regulated.

# Cave Management Level Depends on the Cave, Not the Cave Category

- OPEN ACCESS CAVES
- LIMITED MANAGEMENT CAVES
- NON-SIGNIFICANT CAVES, SINKHOLES, and KARST
- SENSITIVE CAVES
- ENTRANCE RESTRICTIVE CAVES



# Which gets us down to this for each cave

## CAVE RATING SUMMARY

(For determining Cave's Significance and Classification)

CAVE NAME: \_\_\_\_\_

EVALUATED BY: \_\_\_\_\_

DISTRICT: \_\_\_\_\_

DATE: \_\_\_\_\_

LEGAL: \_\_\_\_\_

CATEGORY: \_\_\_\_\_

SURFACE SENSITIVITY (L, M, H) \_\_\_\_\_

CLASSIFICATION: \_\_\_\_\_

|                                 | Recreation | Education | Biologic | Geologic | Cultural/<br>Paleo.<br>Resources | Hydrologic | Safety-<br>Hazard | Cave<br>Category<br>APPX C |
|---------------------------------|------------|-----------|----------|----------|----------------------------------|------------|-------------------|----------------------------|
| Resource<br>Level<br>L, M, H    |            |           |          |          |                                  |            |                   |                            |
| Sensitivity<br>Level<br>L, M, H |            |           |          |          |                                  |            |                   |                            |

# Cave Rating Guidelines For Each Category

## Cave Rating Guidelines

### A. Recreational Resource for experienced cavers

1. **LOW:** There is passageway with simple lateral or "maze type" passages. No vertical drops of more than six feet for which there is no obvious bypass. Stable roofs, walls and other rock. This includes crawlways which are short, and not smaller than 24 inches in diameter.
2. **MODERATE:** Multiple passages or simple "maze type" passages. Vertical drops between seven and 100 feet. Crawls of six to ten feet in length and larger than ten inches in height and width. Unstable roof, wall or rocks which can be easily avoided or by-passed. Slick floors or slopes.
3. **HIGH:** Confusing "maze type" passages. Vertical drops over 100 feet. Extremely tight or long crawlways. Unstable roofs, walls or other rock with cannot be avoided.

# SIGNIFICANT CAVE NOMINATION WORKSHEET- 3 pages

## SIGNIFICANT CAVE NOMINATION WORKSHEET

Person or Organization Submitting this Nomination:

Name \_\_\_\_\_

Address \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Street City State & zip

Telephone # (\_\_\_\_) \_\_\_\_\_ Date \_\_\_\_\_

Email address \_\_\_\_\_

Person to contact for additional Information:

Name \_\_\_\_\_ Telephone (\_\_\_\_) \_\_\_\_\_

Name \_\_\_\_\_ Telephone (\_\_\_\_) \_\_\_\_\_

## SIGNIFICANT CAVE NOMINATION WORKSHEET (Continued)

1. Biota: The cave provides seasonal or yearlong habitat for organisms or animals or contains species or subspecies of flora or fauna native to caves, or are sensitive to disruption, or are found on State or Federal sensitive, threatened, or endangered species lists.

YES NO

Description \_\_\_\_\_

# What Gets Reported to the Region (cave name may be redacted)

## Internal Process

- Use existing information in cave files to determine if the cave meets Significance Criteria.
- Submit list to authorized officer - Forest Supervisor (FS), Field Office Manager (BLM), Refuge Manager (FWS) for Designation

## Information for FS Regional Reporting

These caves are hereby officially listed as significant caves.

| Cave Name          | Cave #      | Region | State | Forest   | District     | Criteria*<br>Met | (B) | (C) | (G,M,P) | (H) | (R) | (E,S) |
|--------------------|-------------|--------|-------|----------|--------------|------------------|-----|-----|---------|-----|-----|-------|
| Lava River         | 30401- 001A | 03     | AZ    | Coconino | Flagstaff    | x                |     |     |         |     | x   | x     |
| Pivot Rock Springs | 30402- 002A | 03     | AZ    | Coconino | Mogollon Rim | x                |     |     |         | x   | x   | x     |

\* Criteria include (B)iological, (C)ultural, (G,M,P) Geologic/Mineralogic/Paleontologic, (H)ydrologic, (R)ecreational, or (E,S) Educational or scientific.

[NOTE: Above cave number designations and significance criteria need to be verified with Forest files.](#)

As prescribed in 43 CFR, Part 37.11 (g) this decision is not subject to further administrative appeal.

**Table 1: Forest Service Cave Numbering System.**

| Forest Service Cave Numbering System. (These numbers appear on all cave marker caps, and cave records.) |  |
|---|--|
| 3   | Region 3 (Arizona, New Mexico)   |
| ##  | Region 3 – Forest Numbers:   |
| 04  | 1 Apache Sitgreaves NF      4 Coconino NF      7 Kaibab NF      10 Santa Fe NF<br>2 Carson NF      5 Coronado NF      8 Lincoln NF      11 Tonto NF<br>3 Cibola NF      6 Gila NF      9 Prescott NF |
| ##  | Forest – Ranger District Numbers   |
| 01  | 1 Flagstaff RD<br>2 Mogollon Rim RD<br>3 Red Rock RD   |
| ###   | Cave No. ### on the Unit   |

# Master File and Public File ...

## Appendix H - Individual Cave Management Files

There are **two files** that are kept on the caves on the Forest; the **Master File and the Public File.**

The **Master File** contains the complete information on the cave. The **Master File contains FOIA exempt,** research, sensitive information, Cave Management Plan, and other information on the cave. The **Public File** contains managing information as it relates to the public. This information will vary depending on whether the cave is in Category 1 – Generally Known Caves or, Category 2 – Lesser Known Caves.

Public File information for Category 1 caves may be available at the Forest or District front desks. All other cave related information is available through the Forest or District line officer.

### MASTER FILE

The Master File should be maintained under positive control by the Forest or District line officer. The Access to the Master file is through approval of the line officer. Signed MOUs and/or Non-Disclosure Agreements (NDAs) will help the line officer in determining file access and information distribution.

### PUBLIC FILE

The Public File should contain and include Non-sensitive cave information for the cave's management classification.

# Gating Caves ...

## III. CAVE MANAGEMENT

### A. CAVE MANAGEMENT TECHNIQUES

In order to protect valuable cave resources, a variety of management techniques can be used. These may be used in different combinations or individual techniques may be altered to produce a more desirable management. A description of common management techniques is presented in [Appendix G – Cave Management and Monitoring](#).

The decision to gate a cave is often warranted for various reasons (safety, public encroachment, resource sensitivity, species protection, etc) but it should not be taken lightly. If it is determined that a cave gate is needed, it changes the cave's priority level. Cave gate related items are included in [Cave Gates](#) and [Entrance Restrictive Caves](#). Interim closure orders, the cave's management prescription including access levels is needed. Usually safety and biological comments are helpful in developing a safe gate design that will not deny habitat. Additional considerations are listed in section [L. ADJUSTING MANAGEMENT](#), and section [H. LIMITS OF ACCEPTABLE CHANGE \(LAC\)](#).

# Gating Caves ...

## Cave Gates

At a minimum, an interim cave management closure is required prior to the installation of a cave gate.

A cave management plan is preferred. Cave gates may be required to protect sensitive resources and maintain or change the cave management category. These categories are listed in [Appendix C – Cave Management Categories](#) and [Class 5 – Sensitive and Pristine Caves](#). For example, a sensitive species is discovered to be using the cave. The management category and class may change from Natural to Sensitive. Gates detract from the entrance area of a cave, but usually this detraction is offset by the need to preserve very fragile, near pristine resources or keep visitation within limits consistent with a cave's management objectives. Cave gates are constructed so as not to interfere with wildlife use or restrict air flow into and out of the entrance and should be maintained. A permit system to enter beyond the cave's gate may be implemented when appropriate.

Individual cave management prescription contents are presented in [Appendix H - Individual Cave Management Files](#).

Cave gates, though not a preferred management tool, are applicable to multiple Cave Management Classes.

# Archeology and SHPO ...

## F. CAVE EXPLORATION

Above-ground searching for caves, or ridge walking, is an appropriate use of Forest land and does not require authorization. New and previously unknown portions of caves have been discovered through excavations. Excavations, however, have the potential to affect biological, archeological, and paleontological values. For these reasons, cave exploration using larger equipment (examples include motorized, wheeled, and generator powered equipment) resulting in more than one cubic meter of cumulative disturbance will require compliance with the NEPA process, the Archeological Protection Act, and a District special use permit<sup>9</sup>. Smaller activities which include developing new, enlarging existing, and using buried entrances; digging within caves; and enlarging existing passages do not require authorization. Upon notification of the location of the dig, the USFS has a 60 day period to go out and confirm the dig is not disturbing archeology. This is to meet USFS/**SHPO** Region 3 working/reporting standards.

**If archeological artifacts are noted during the excavation process at any time, the dig shall stop immediately, and the NEPA process followed before continuation of the dig.**

The excavation request should include the location, nature, and duration of the dig. If the effects of the excavation on resource values are none, or can be mitigated, a free permit will be issued. The need for a rehabilitation bond will be considered when the permit is approved. If so requested, locations and nature of excavations will be considered confidential information.



# Cave Research Guidelines

## Appendix B - Cave Research Guidelines

The following guidelines will be incorporated into research permits as applicable:

1. All research conducted within the Forest requires the submittal of a written proposal and subsequent approval of the appropriate District Ranger or designated cave management resource specialist. The USFS may solicit the assistance of outside specialists in various disciplines in the vetting of cave researchers and proposal analysis. Approval to conduct research within Forest caves will be made on a case-by-case basis after USFS review and acceptance of the research proposal. Proposals must justify the need for the collection of specimens or sampling of other cave resources. Animals temporarily removed from Forest caves for research purposes shall be repatriated to the source cave upon completion of research activities as practicable. Specimens removed from Forest caves as part of research efforts shall ultimately be placed in a suitable public repository capable of proper curation and permanent housing of the specimens. A uniquely numbered USFS scientific collecting permit must be obtained by the proponent prior to initiating any sampling within caves.
2. Researchers should use non-consumptive techniques wherever possible. If it will be necessary to alter or damage cave resources in order to obtain useful scientific data, the researcher is required to

# What and Where?

- <http://centralarizonagrotto.webstarts.com/index.html>
- Arizona National Forest Cave and Karst Management Documents
- Bibliography
- Change Log
  
- The PDF is for easy downloading
- The MS Word document is yours for the asking. I would just like to keep some notes as to where it is going

## Bibliography and Sources (partial)

- Tonto NF (AZ) Cave Management Plan draft, 1991
- Coconino NF (AZ) Cave Management Plan draft, 1991
- Sierra RD, Coronado NF (AZ) Cave Management Plan draft, 1990
- Tongass NF (AK) Forest Plan (2008)
- Karst Inventory Standards and Vulnerability Assessment Procedures for British Columbia
- Karst Management Handbook Training, British Columbia Ministry of Forests, 2003
- NCKRI, George Veni, draft analysis
- BLM, Jim Goodbar, grazing standards on karst
- Apache-Sitgreaves NF Hydrologist John Rihs
- NSS cavers in the Arizona Region

# The status comes down to this:

- Caring USFS staff are over burdened with other priorities
- As new personnel come in, they are not aware of the caves and karst they manage
- Surface management (grazing and timber harvesting) adversely impacts the karst
- File management (public and non-public) is not identified
- Volunteers do not have Forest level cave management plans, or structure to help the Forest personnel.
- Volunteer agreements are not in place to help with projects. Executing Forest Level Challenge Cost Share or Volunteer agreements would improve USFS long term memory.
- The USFS and the NSS have a signed MOU (2011)

# Volunteer Help Available

- Create Master Challenge Cost Share agreements with NSS Grottos (CAG, NAG, SAG, EGI, CCC)
  - These are 5 year contracts
- Use Supplemental Project Agreements (SPAs) to implement projects



Questions?