Coconino NF Plan Draft Comments

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General:

1. Coconino NF has many significant caves, including lava tubes. Coconino NF has thousands of acres of karst topography. Karst is fragile. Karst includes sinking streams, sinks, and caves. Cave entrances are Karst features.

   Please include "karst" and "pseudokarst" when presenting cave related management. Caves are a subset of karst.

   Coronado NF's Forest Plan draft defines Karst as:
   Karst resources: The elements of a karst landscape, commonly characterized by losing streams, sinkholes, collapse features, caves, or springs. These may not only be physical features, but may also relate to karst groundwater systems, system(s) function, and biological significance to the vegetative, wildlife, and aquatic communities.

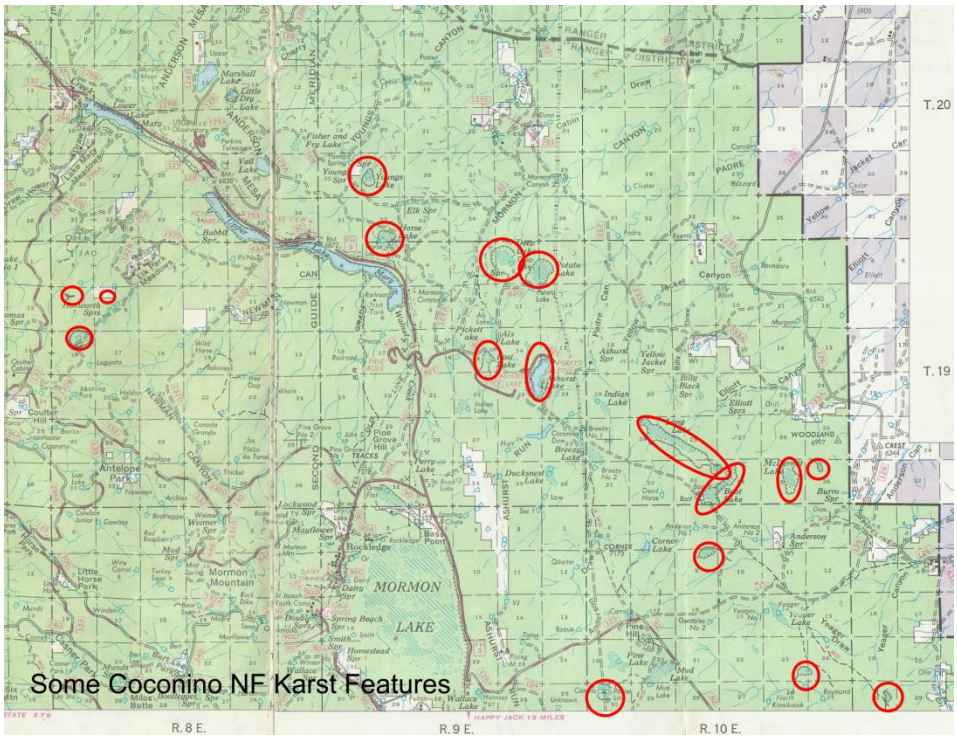
   Wikipedia defines **Pseudokarst** as: Pseudokarsts are similar in form or appearance to karst features but are created by different mechanisms. Examples include **lava caves** and granite.

2. In the Biophysical Features General Description add a short definition of "karst". The definition of 'cave is included in the first paragraph.

3. Include "Karst" as a Land Use Designation. With the understanding that obtaining a separate karst land use designation is unlikely, achieving karst management awareness is still needed.

4. The Forest Plan, page 248, refers to the Coconino National Forest Cave Resource Management Guide as a referenced document. Please title the document **Coconino National Forest Cave and Karst Management Guide**. Coconino NF land managers Charlotte Minor and Polly Haessig are actively updating the document with volunteers.

Figure 1. Partial Map of larger Coconino NF Karst Features.



Notes:

Page 27 - **Biophysical Features**

1. Page 27 In Biophysical Features, rename the Section from "Caves, Cliffs, and Talus Slopes" to "**Caves/Karst/Pseudokarst**, Cliffs, and Talus Slopes"
2. Rename the following Biophysical Features sub-section names to reflect the above change:

Current Name	**Preferred Name**
Caves, Cliffs, and Talus Slopes	Caves/Karst/Pseudokarst, Cliffs, and Talus Slopes
General Description and Background for Caves, Cliffs, and Talus Slopes	General Description and Background for Caves/Karst/Pseudokarst, Cliffs, and Talus Slopes
Desired Conditions for Caves, Cliffs, and Talus Slopes	Desired Conditions for Caves/Karst/Pseudokarst, Cliffs, and Talus Slopes
Guidelines for Caves, Cliffs, and Talus Slopes	Guidelines for Caves/Karst/Pseudokarst, Cliffs, and Talus Slopes
Management Approaches for Caves, Cliffs, and Talus Slopes	Management Approaches for Caves/Karst/Pseudokarst, Cliffs, and Talus Slopes
Related Plan Content for Caves, Cliffs, and Talus Slopes	Related Plan Content for Caves/Karst/Pseudokarst, Cliffs, and Talus Slopes

3. The Biophysical Features section needs to include reference to the **Coconino National Forest Cave and Karst Management Guide** (listed on page 248 of the plan).
   This can be accomplished by adding a FW-BioPhys-Geo-G list item of:

Caves karst and pseudokarst are managed consistent with the **Coconino National Forest Cave and Karst Management Guide**.

The reference needs to be in the page 29 FW-BioPhys-Geo-**G** section because list item 1 provides the karst buffer size

4. On page 28, 3rd paragraph add caving as a recreational activity dependent on biophysical features.

surface water system. Recreational activities dependent on biophysical features (e.g., rock climbing) occur on the forest. Several rock climbing areas on the forest are nationally and internationally known.

add caving with rock climbing

5. Leave the cave/karst buffer zone at 300 feet. The cave management guide lists a 300 foot karst buffer

Guidelines for Caves, Cliffs, and Talus Slopes

FW-BioPhys-Geo-G

change to 300

currently 300 feet on Coconino. 300 feet is in line with several other forests and British Columbia.

1 To prevent siltation into sinkholes, cave entrances, collapse of cave passageways, and alteration of the chemical, physical, and biological conditions of the cave resource, project design should include protections for cave entrances and subsurface geology, where they occur. A radius of 200 feet should be used for restrictions on activities[11] that can alter the cave's resources, functions and associated features unless site-specific adjustments are made based on topography, drainage, soil type, and the expected impact of the proposed activity.

Siltation reduction by livestock grazing in karst areas, especially with open entrances, sinking streams, and sinkhole, is a primary, mitigating, management action.

6. In FW-BioPhys-Geo-DC #4 , add hydrological to the list.

Desired Conditions for Caves, Cliffs, and Talus Slopes

FW-BioPhys-Geo-DC

4 Archaeological, geological, paleontological, and biological features of caves are not disturbed by visitors.

add hydrological to this list. see siltation comments above

It is not good to prevent non-turbid water from flowing underground. i.e. aquifer recharge. It is good to prevent siltation.

7. In FW-BioPhys-Geo-DC #7 , add caving to the recreational activities list.

8. In Management Approaches, a second cave management guide reference also needs to be included … since this is management …

Caves karst and pseudokarst are managed consistent with the **Coconino National Forest Cave and Karst Management Guide**.

Add a list item:
Retain records for caves/karst/pseudokarst at Forest Services offices when they need to be accessed regularly for research purposes. Maintain electronic records, including an index of documents research value.

Other sections in the document need to reference the Biophysical Features section in the "Related Plan Content …" references. Some sections that already reference cave and karst related items need to be updated or included in the following sections:

Section – Related Plan Content …	**Action**
Related Plan Content for Paleontological Resources	Update Caves, to Biophysical Features to Caves/Karst/Pseudokarst
Related Plan Content for Alpine Tundra	Update Caves, to Biophysical Features to Caves/Karst/Pseudokarst
Management Approaches for Soil	Add reference to Biophysical Features Caves/Karst/Pseudokarst
Related Plan Content for Stream Ecosystems	Add reference to Biophysical Features Caves/Karst/Pseudokarst
Related Plan Content for Springs	Add reference to Biophysical Features Caves/Karst/Pseudokarst
Related Plan Content for Vegetation	Add reference to Biophysical Features Caves/Karst/Pseudokarst

In Stream Ecosystems starting on page 21:
Add wording for Sinking streams – there are at least two on the Coconino going into caves. Both are intermittent streams, and the karst areas are several hundreds of acres each. Adequate wording might be:

Intermittent and ephemeral sinking streams are karst features and provide nutrients for cave ecosystems. The sensitive microhabitats are affected by surface disturbance.

FW-Aq-Strm-DC
Add list item: Sinking streams maintain minimal disturbance and buffer zones.

In Spring Ecosystems starting on page 26:
FW-Aq-Spr-DC
Add list item: A few springs are karst features and need buffer zones to which maintain minimal disturbance.

In Paleontological Resources starting on page 30:
FW-BioPhys-Paleo-G
Add list item: No collecting of paleontological resources is allowed in cave without a forest research permit.

In Vegetation starting on page 32:
FW-Veg-All-DC

Include caves/karst/pseudokarst to the unique plant community habitats. Cave entrances are inter ecotone access points.

Fine Scale (10 acres or less)

13 Endemic rare plant communities are intact and functioning.

add Caves/Karst

14 Unique plant community habitats (e.g. limestone cliffs, margins of springs, Verde Valley Geological Formation, basalt lava flows/cinders, calcareous soil/alkaline clay, canyons/cliffs and ledges, granitic soils/igneous rocks, and sandstone rocks/soils) are present to maintain self-sustaining populations of associated native plant species.

15 Habitat conditions promote pollinator success and survival.

16 Snags are present in adequate numbers to provide habitat features such as cavities and loose bark.

In Guidelines for Livestock Grazing include "karst features" as sensitive features.

Guidelines for Livestock Grazing

FW-Graz-G

1 To protect riparian area function, the placement of salt, minerals, and/or other supplements for the purposes of livestock management should be located further than a quarter of a mile from riparian areas or seasonally present water that is not overland flow.

2 New and existing water developments, corrals, and other handling or loading facilities should not adversely affect occupied sensitive plant habitat.

Grazing in karst features causes ground disturbance that transfers directly into and restricting the karst aquifer.
Karst features should be included in the sensitive resources list.
Fencing may be necessarey to protect the resource.

3 Livestock salting should be located away from sensitive resources, such as known locations of Southwestern Region sensitive plant species and archaeological sites, so these resources are not affected by associated trampling.