

# Austin Chalk & Karst Invertebrate Species

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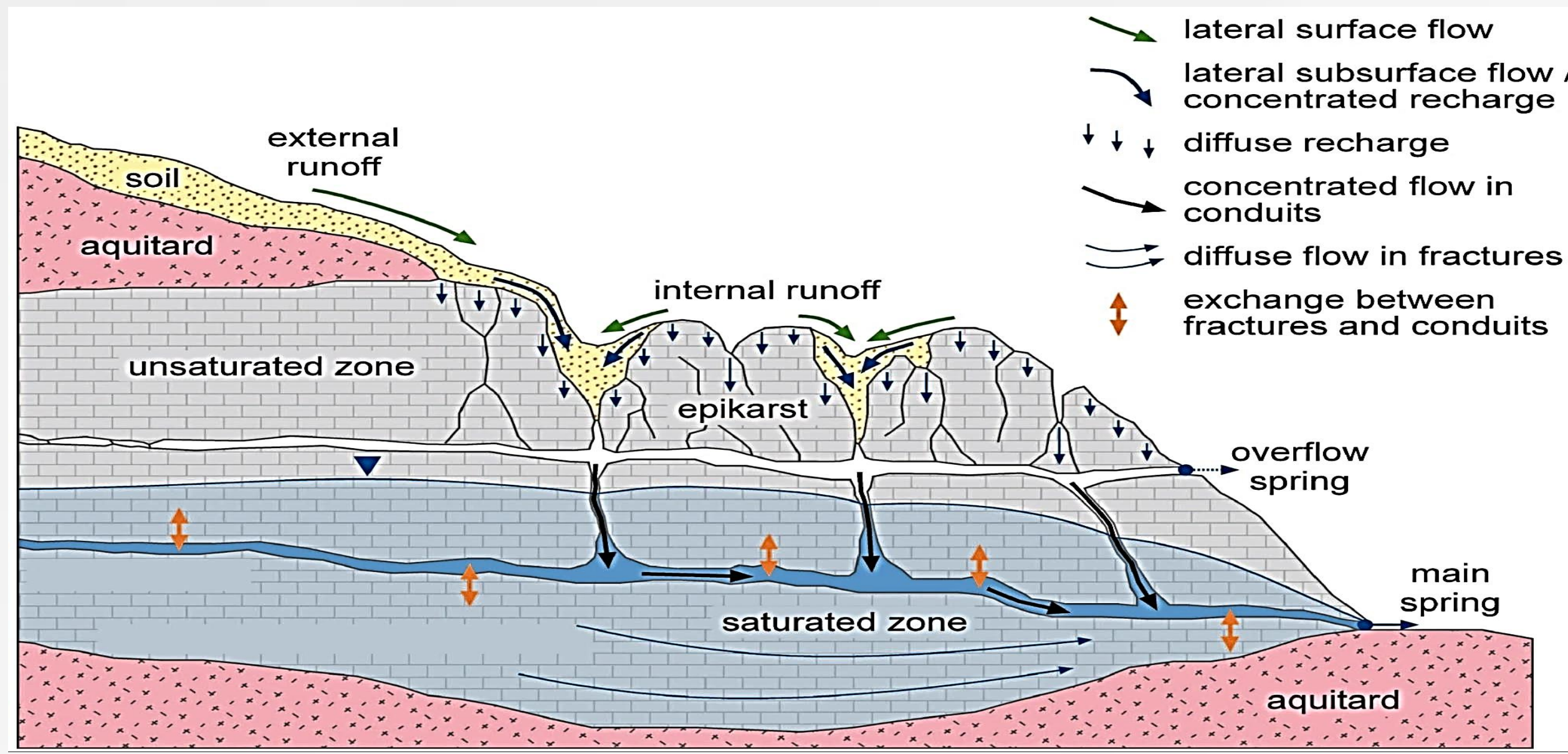


The University of Texas at San Antonio



## What Is Beneath Our Feet?

- The ground on campus and in the Bexar county area is mostly Austin chalk.
- Austin chalk is a sedimentary rock consisting of limestone and shale that is composed of calcium carbonate from the shells of tiny marine animals, and from the remains of marine algae. Chalk is generally white or light gray in color, has a grainy, brittle texture, and is flaky. Chalk is very porous, absorbent, and permeable, allowing water to move through it easily (King, 2012).
- Most chalk was formed 91 to 81 mya during the Cretaceous period (King, 2012).



Water Underground | Of Karst! - short episodes about karst (egu.eu)

## Karst Topography

- Austin chalk provides perfect conditions for the formation of Karst topography and landscapes.
- Karst is a distinct topography that consists of absorbent and permeable rocks which allows water to move through it. Over time, the water running through the rock allows tunnels and caves to form. These tunnels and caves offer suitable habitats for many different invertebrate animal species (LibreTexts, 2024).
- This landscape has features that include sinkholes, caves, disappearing streams, and underground drainage systems (Pearson, 2012).

## Karst Invertebrate Species

- Karst invertebrates are troglobitic animals, which are animals that are specifically adapted to and only live underground (U.S. Fish and Wildlife Service, 2014).
- Adaptations to this environment can include small eyes or complete lack of eyes, long appendages, and reduced pigmentation.

## Endangered Karst Invertebrates

There are 6 endangered species native to the San Antonio, Bexar county area.

- |                             |                                 |
|-----------------------------|---------------------------------|
| a. Tooth cave ground beetle | b. Tooth cave pseudoscorpion    |
| c. Tooth cave spider        | d. Kretschmarr cave mold beetle |
| e. Bone cave harvestman     | f. Bee creek cave harvestman    |

These species are protected by Balcones Canyonlands Conservation Plan (Austintexas.gov, 2024).



Fig a.



Fig b.



Fig c.



Fig d.



Fig e.

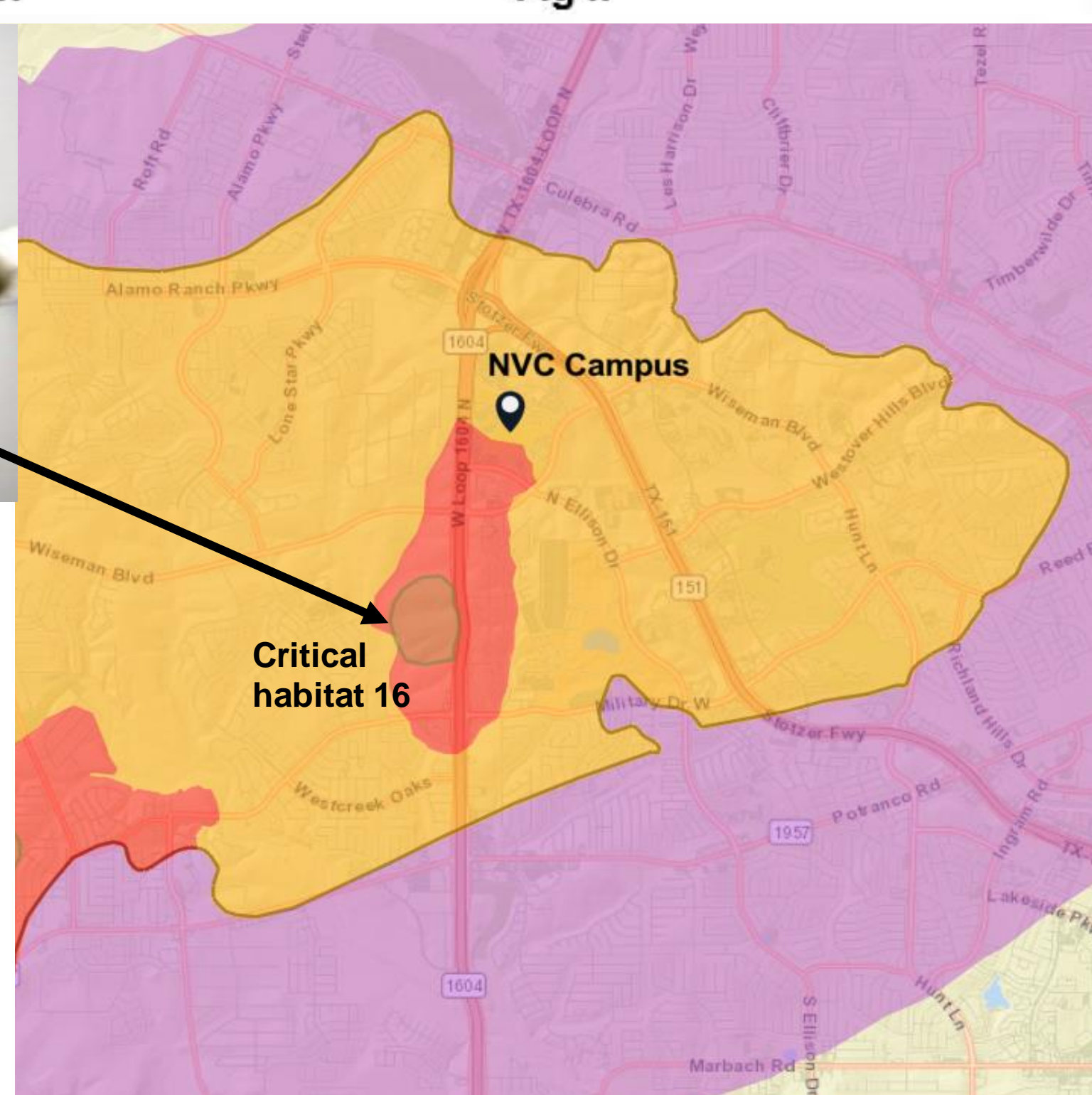


Fig f.



Fig g.

**Karst zone 1 (red)** - Area known to contain invertebrate species  
**Karst zone 2 (yellow)** - Areas with high probability of containing invertebrate species  
**Critical habitat (brown)** - Areas known to contain endangered invertebrate species



Bexar County, Texas Endangered Karst Invertebrates. Arc GIS. Map, 2019.

## Karst Regions

- Karst regions are mapped to keep track of where invertebrates live.
- We are in the Culebra Anticline Karst Fauna Region ([arcgis.com](https://www.arcgis.com), 2019).
- Karst zone 1 (red) along W loop 1604 spanning from N Ellison to W military is known to contain invertebrate karst species
- Karst zone 2 (yellow) has a high probability of containing invertebrate karst species.
- Critical habitat 16 (brown) located off 1604, across Reed road, is known to contain the endangered invertebrate species *Rhadine infernalis* (Fig g) which has no common name ([arcgis.com](https://www.arcgis.com), 2019).

## Importance, Impact & Protections

- Karst landscapes are especially sensitive to project development. It's important to support the innovation of various habitats and water supply for local environments (LibreTexts, 2024). The long-term monitoring of karst invertebrate populations, ecosystems, and habitats is vital to properly evaluate and implement effective strategies to mitigate any possible damage that may occur during construction and development.
- U.S. Fish and Wildlife Service has specific guidelines regarding the monitoring and protection of these species including the control of invasive fire-ant populations, invertebrate population surveys, humidity maintenance, maintenance of cave nutrients and surface plant populations, as well as limiting visitation to the caves where invertebrates reside (U.S. Fish and Wildlife Service, 2014).
- To monitor karst populations effectively, it is important to survey the land and mark the various zones and categories of karst habitats. These surveys will help retain good habitat conditions and be utilized to devise an action plan to maintain the current environment while continuing the development of the Northwest Vista Campus (Austintexas.gov, 2024).
- Stygobionts, or animals which live within groundwater systems play a critical role in water purification and the biodegradation of contaminants and pathogens. The decline or extinction of one species in a community may have cascading negative effects on other species through complex interactions, leading to ecosystem decay. In the worst case, ecosystem function could be impaired to the point that water quality declines (Devitt, 2019).

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