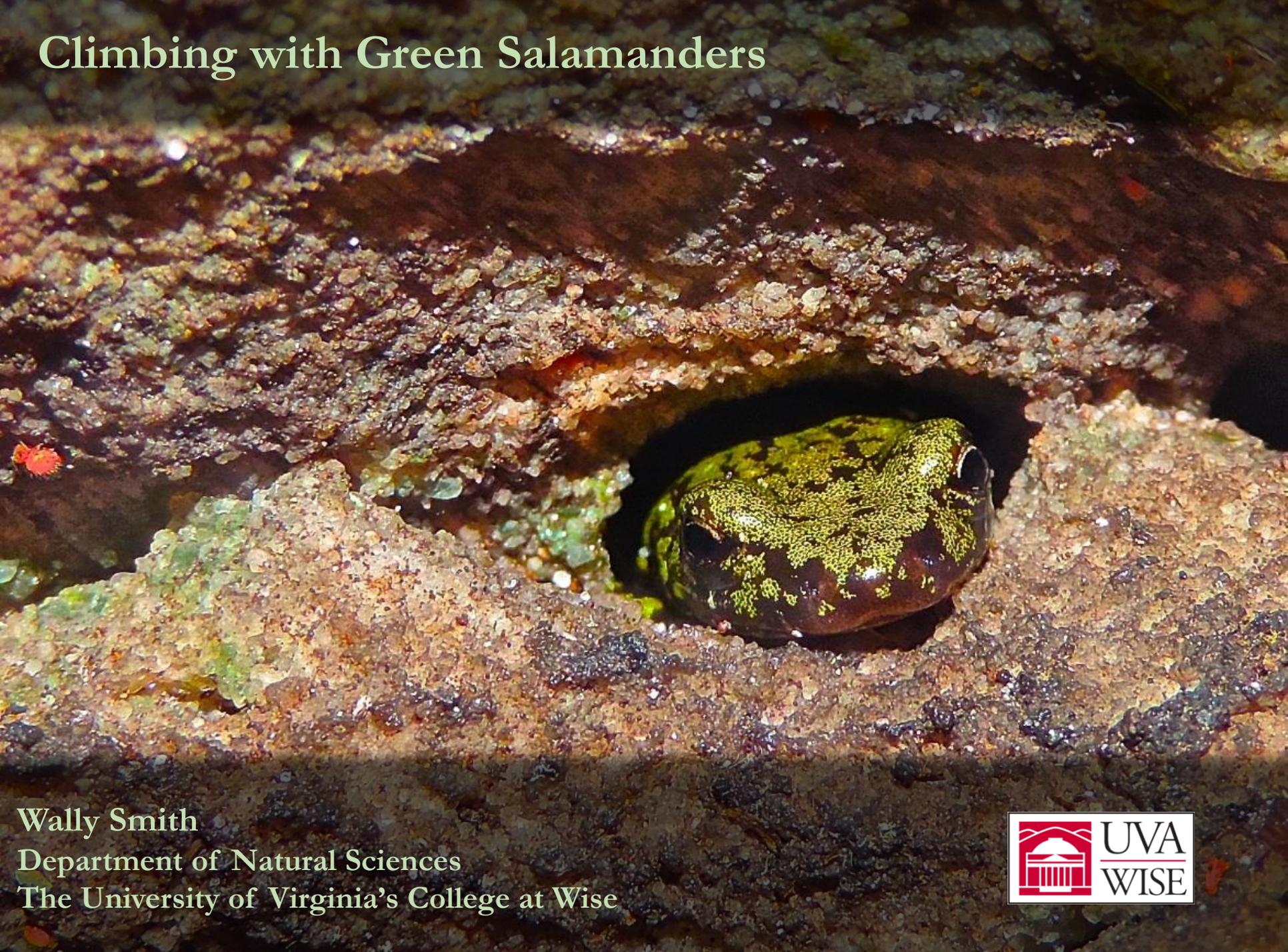


Climbing with Green Salamanders



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Green Salamander (*Aneides aeneus*)

- The Appalachians' only true climbing salamander
- Lives in cracks and crevices in vertical rock structures (cliffs, boulders, outcrops)
- Climbs into the forest canopy for short bouts in warmer months
- Has declined in many areas and appears to be sensitive to disturbance





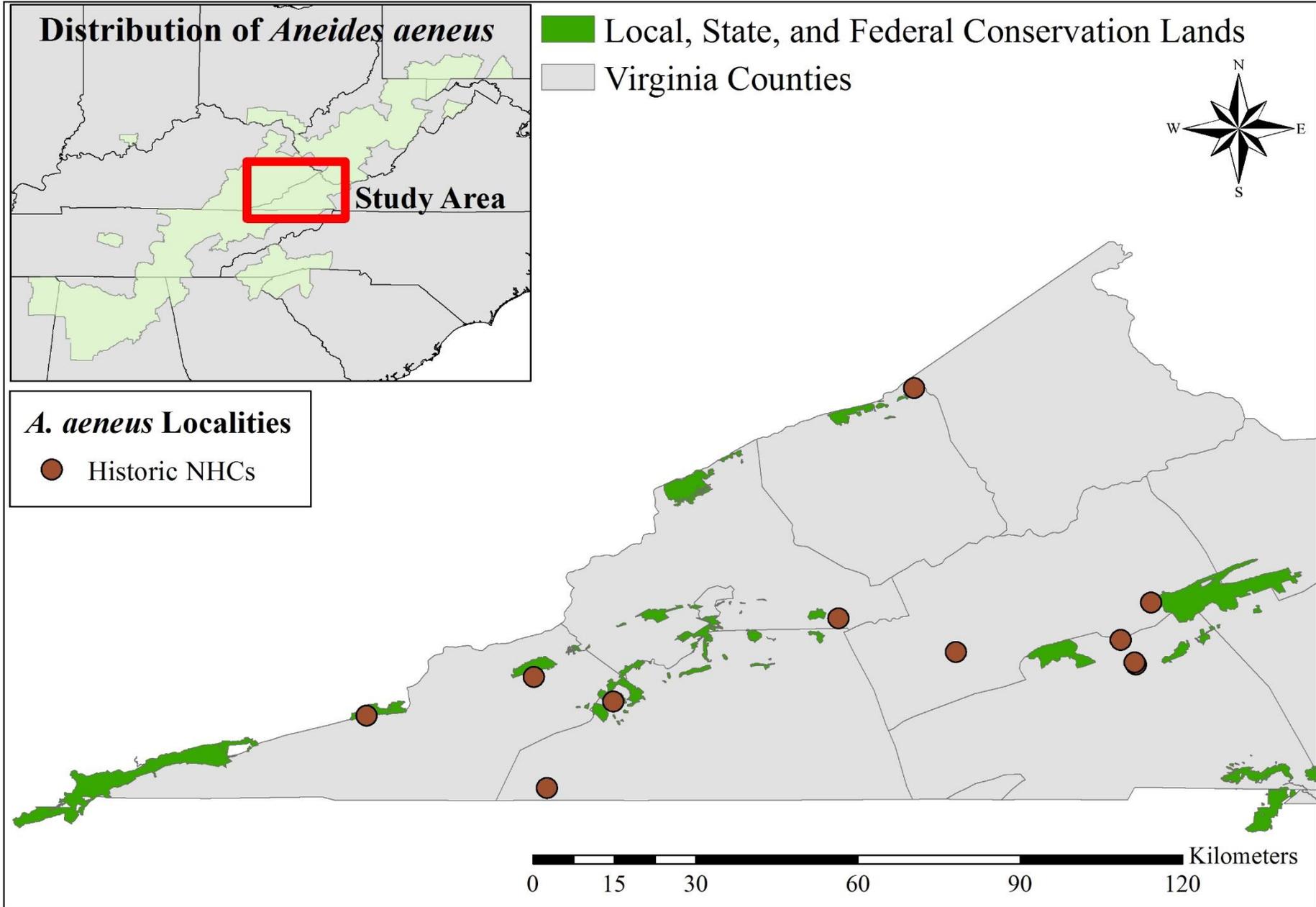


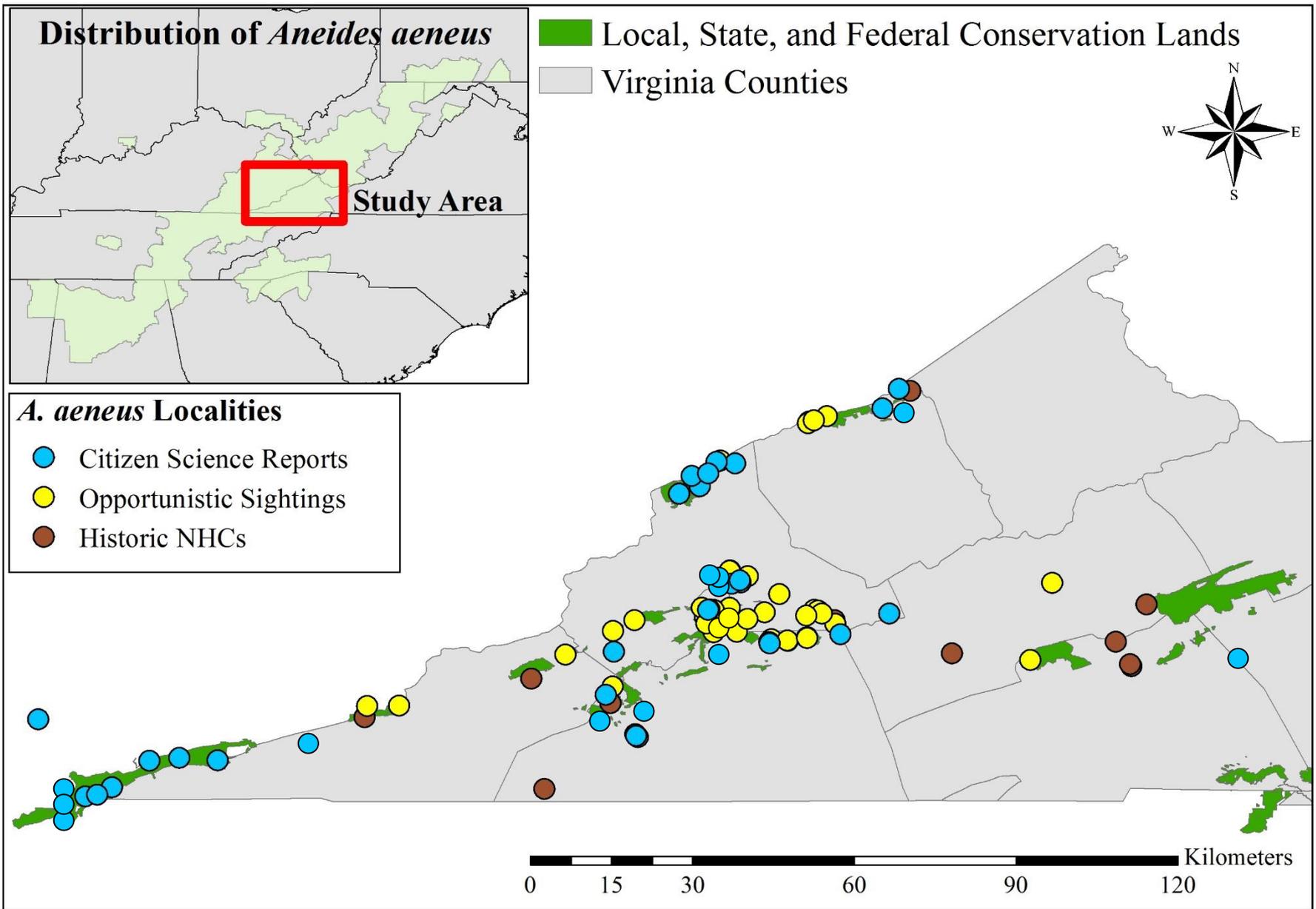


Photo by Chris Thawley via Arkive



Historic Localities in SW Virginia (1860s-2014)





Smith et al. (2015), *IRCF Rept. Amph.*; ongoing surveys

How do Green Salamanders and climbing interact?

- Short Answer: We don't know! Little formal work has been done on the impacts of outdoor recreation on this species...
- ...however, we do know what specific habitat features Green Salamanders prefer and how disturbance impacts the species, generally speaking.
- **It is very likely that this species occurs at most climbing destinations throughout SWVA and eastern KY, provided that good canopy cover and shading are present.**



What do we know about salamanders' habitat needs?

- 100 crevices randomly marked, surveyed weekly during spring/summer each season



Table 1. Habitat characteristics of unoccupied crevices ($n = 74$) and crevices occupied by Green Salamanders (*Aneides aeneus*) ($n = 26$) on at least one survey occasion at a complex rock outcrop system on Stone Mountain, Virginia, in 2013.

Crevice type	Aspect (azimuth)	Slope (°)	Crevice height (cm)	Crevice width (cm)	Crevice depth (cm)	Distance above ground (cm)	Canopy cover (%)	Litter depth (cm)	Tree count	Distance to trees (cm)
Occupied	44.0±17.6	21.4±7.1	15.5±26.2	36.1±36.6	16.3±12.4	137.6±34.2	100.0±0	17.5±4.2	7.2±2.9	76.6±40.8
Unoccupied	48.2±21.5	17.4±5.3	19.8±71.6	44.6±38.5	11.8±10.3	129.6±38.9	99.9±1.2	18.1±6.9	2.4±3.7	83.6±42.9

Note: Values reflect means ± 1 SD across sites.

Individual crevices can be “home” for years



24 June 2016



15 June 2017



Best Practices/Considerations for Climbing with Green Salamanders

- **1.) Work Around Vegetation:** Minimize the removal of large amounts of vegetation when developing a new site, especially rhododendron/laurel and other vegetation directly adjacent to the rock face.



Best Practices/Considerations for Climbing with Green Salamanders

- **2.) Look Before You Brush:** Where possible, inspect crevices before brushing or clearing them. Try to avoid brushing the interior portions of crevices.
- If you're developing a new site, consult your state's wildlife agency to make sure that this site does not overlap with particularly abundant and/or critical Green Salamander populations.



Best Practices/Considerations for Climbing with Green Salamanders

- **3.) Avoid Chemical-Based Graffiti Cleaners, Especially for Large Areas of Rock Faces:** Many cleaners contain acidic compounds that may harm or kill salamanders and other wildlife, especially when combined with high-pressure rinsing.



Prepared according to Global Harmonized System (GHS) standards

SECTION 1

CHEMICAL PRODUCT IDENTIFICATION

Lubrication Technologies, Inc.
900 Mendelssohn Avenue North
Golden Valley, MN 55427-4309
Tel: 763-545-0707

Product Trade Name:

Elephant Snot Graffiti Remover

CAS Number: Mixture
Synonyms/Other: N/A
Recommended Use: Graffiti remover
Restrictions on Use: Not determined
Created Date: 4/24/2015
Preparation/Revision Date: 1/12/2018
Emergency Phone Number: 1-800-424-9300 (CHEMTREC)
SDS CODE: 13309

SECTION 2

HAZARD IDENTIFICATION

Appearance: Grey gelatin
Odor: Slight chemical odor
Classification: Skin corrosion / irritation category 1
Sensitization - skin category 1
Eye damage / irritation category 1
Acute Toxicity - oral category 4
Acute Toxicity - dermal category 4
Acute Toxicity - inhale category 4

Target Organs: Skin, Eyes, Lungs

Pictogram(s):



Signal Word: DANGER

Hazard Statement:

H302 - Harmful if swallowed
H312 - Harmful in contact with skin
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H332 - Harmful if inhaled

Other Hazards:

Not determined.

Prevention:

P260 - Do not breathe dust/fume/gas/mist/vapours/spray
P264 - Wash hands thoroughly after handling

Mentions of health impacts to humans in a product's MSDS sheet are usually a good indicator of potential impacts to crevice-dwelling wildlife, if these are not directly listed.

If you see a salamander, let us know!

- Citizen science reports are critical ways for us to better understand local populations and the species overall
- If you encounter a Green Salamander while climbing:
 - 1.) Avoid handling or removing the animal;
 - 2.) Take a photograph for verification, if possible, and;
 - 3.) Contact Wally Smith (whs2q@uvawise.edu) with info on when/where the sighting occurred



Have you seen a Green Salamander?

Why are we interested in Green Salamanders?
Our research indicates that green salamanders may be more plentiful in our region than we once believed. That's why we're asking the public to help us develop a better understanding of these colorful creatures.

Identifying characteristics include:

- A black back with yellowish-green patches
- A pale yellowish-white belly
- A flattened body and tail
- Square toes
- A total length of 3 to 6 inches long, including the tail

Suggested places to look include:

- Tree trunks and downed logs
- Rock outcrops
- **Not** typically in or around streams

You can assist our scientific research by sharing information.

If you see a green salamander, please do not handle it or remove it from its habitat. We ask only that you take a photo with a camera or cell phone and contact:

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VH Virginia Highlands COMMUNITY COLLEGE

UVA WISE

Green salamander research is a collaborative project of The University of Virginia's College at Wise, Virginia Highlands Community College and the Virginia Department of Game and Inland Fisheries. Each is an EEO/AA organization.