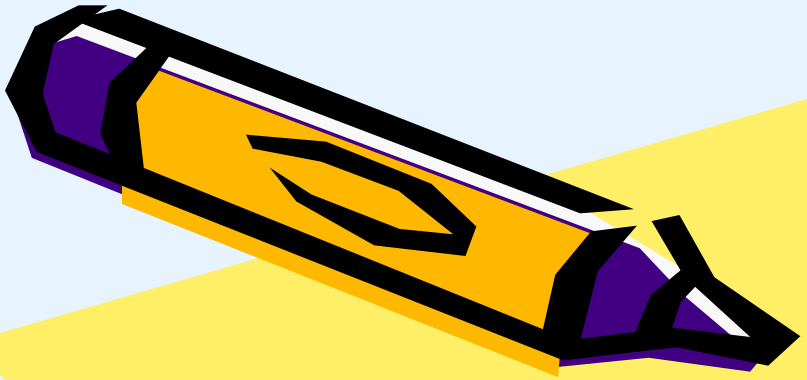
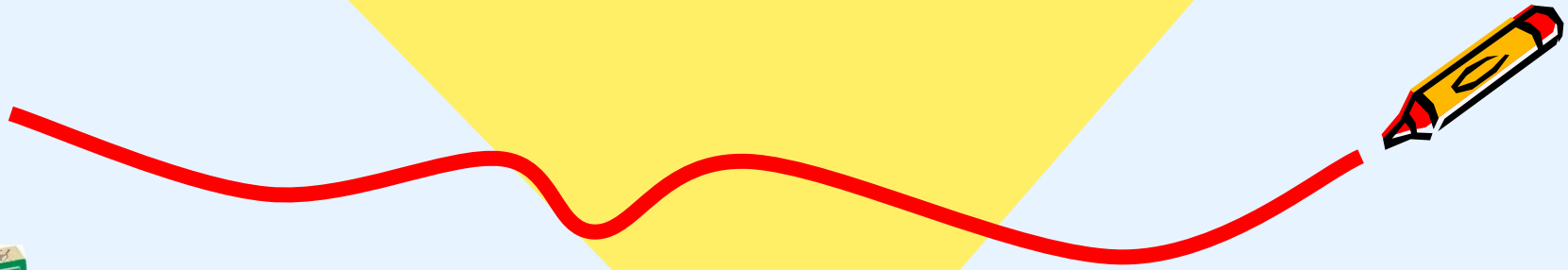


Bat Management

Nebraska Extension



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Bat Facts

- Nocturnal, flying mammals
- Not rodents
- Fly with "hands"
- Have claws
- Can crawl on ground
- Good vision
- Timid and gentle, avoid human contact

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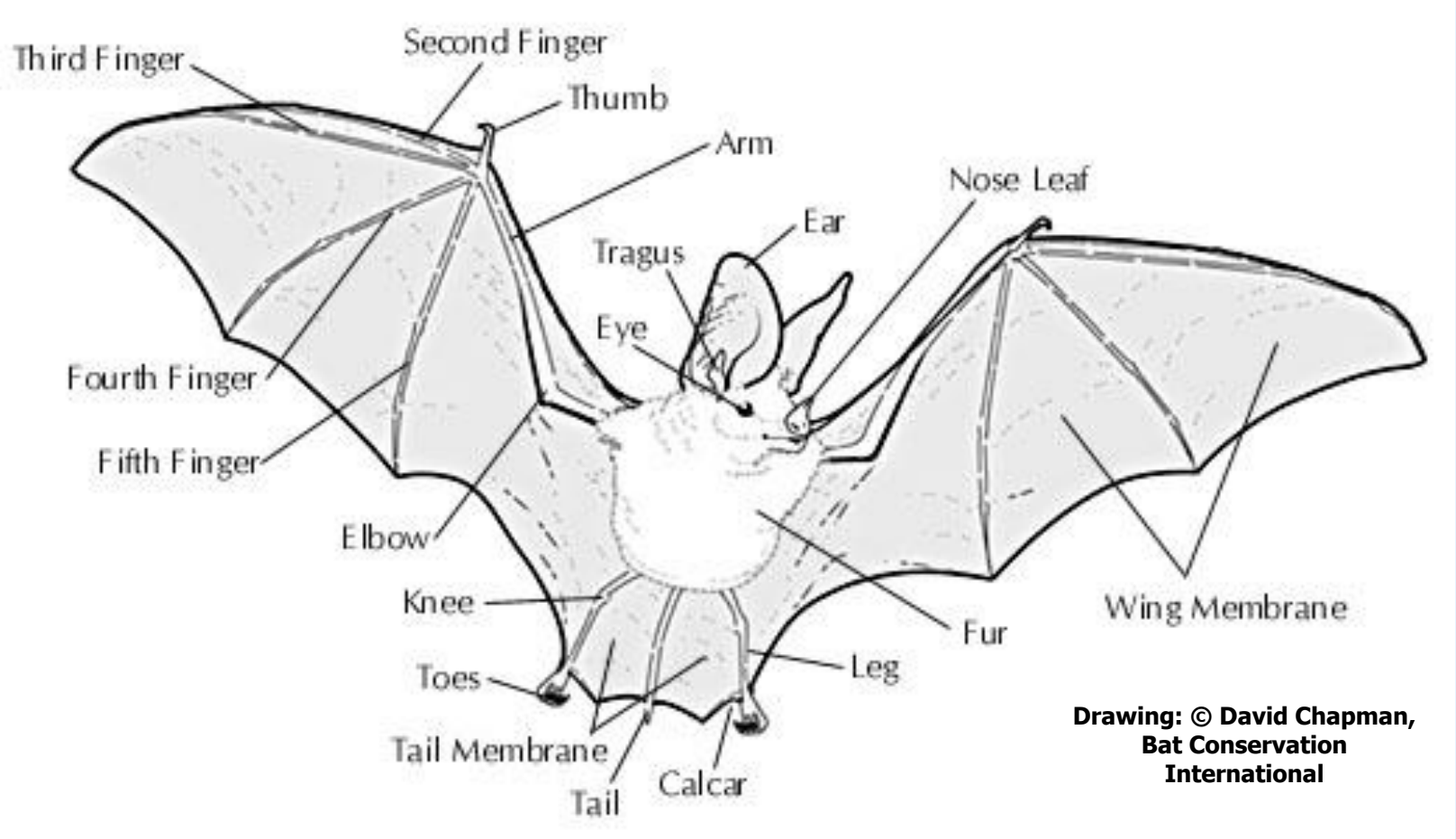
Bat Anatomy



Drawing: © David Chapman, Bat Conservation International

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Nebraska Bats Are NOT Bloodsuckers!

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Bat Facts

- Eat and drink in flight
  - Water scooped up into a "cup" area between hind leg and tail from lakes, pools, and other sources of standing water
- Fragile "needle-like" teeth
  - Unable to chew through structural materials like wood or caulking
- Use sonar to find food
- Nebraska bats feed on insects

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Bat Facts

- Consume $\frac{1}{4}$ to $\frac{1}{2}$ body weight of insects each night; colony can eat over 100 tons of insects in one season
- Bats in Nebraska kill more mosquitoes and other insects than birds or bug zappers

Big Brown Bat eating a mealworm. Never hold a bat without wearing leather gloves.

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Bat Facts


Photo: University of Nebraska–Lincoln

- Live in caves, hollow trees, loose bark, rocky ledges
- In cities, may be found in down spouts, behind house shutters, attics, and storm sewers

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Bat Reproduction

- Low reproductive rate
  - 1-2 young per year
- Mate early fall, fertilization takes place late winter or early spring
  - Young born 6-8 weeks later
- Parental care
  - Mother stays with young until late summer

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Common Nebraska Bats

Big Brown Bat *[Eptesieus fuscus]*

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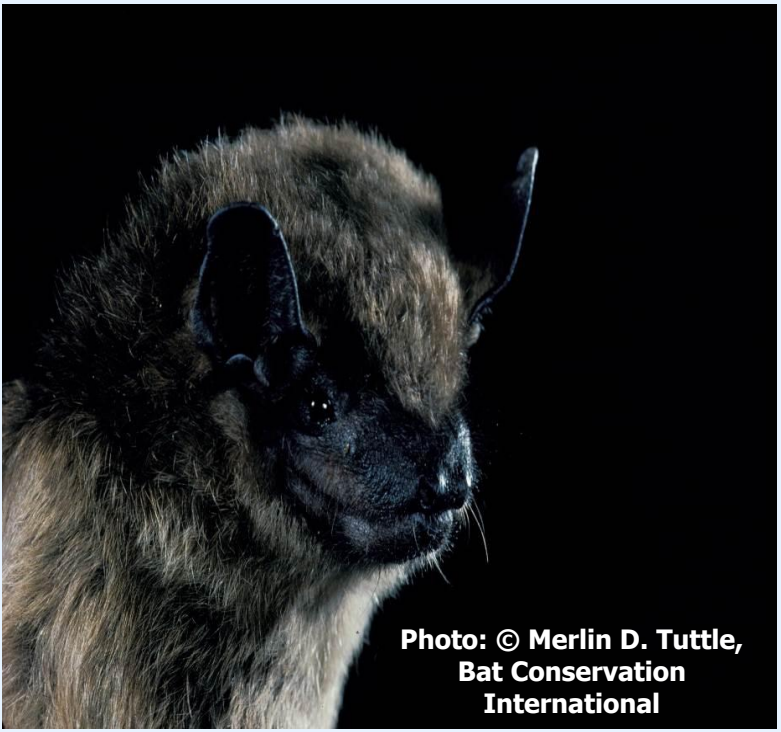
Big Brown Bat
[Eptesicus fuscus]



- Commonly encountered by the public
- Five inches long from nose to tail
- Brown with darker brown skin on nose, ears, and wings and pale brown underside
- Live in colonies
- Remain in Nebraska year round

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Major Nebraska Bats

Little Brown Bat *[Myotis lucifugus]*

Photo: U.S. Fish and Wildlife Service
National Image Library

Always wear gloves when handling bats!

Can be difficult to distinguish from big brown bats

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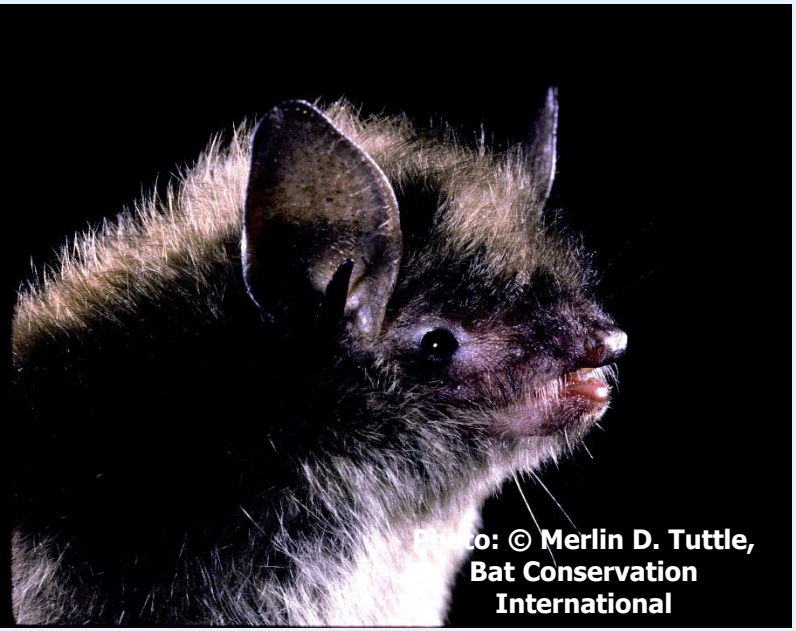
Little Brown Bat
[Mytois lucifugus]



- Located in Eastern ⅓ of the state
- Three to four inches long
- Dark brown; "glossy" in appearance

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Red Bat
[*Lasiurus borealis*]

- Found statewide
- About five inches long from nose to tail
- Bright-reddish brown to rust colored on top, paler red underside, and cream patches on each shoulder
- Migrate south in winter

Photo: © Bat World Sanctuary (www.batworld.org)

Never hold a bat with bare hands!!!!

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Human-Bat Interactions

- Beneficial
  - Insect feeders
  - Ecological and Economic importance
    - ✓Eat agricultural pests, such as corn rootworm, thus reducing need for pesticides
    - ✓Guano used as fertilizer
      - 10% nitrogen, 3% phosphorous, 1% potassium; safely enhances plants
      - Long lasting in soils
      - Use only in small amounts and in well ventilated areas

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Human-Bat Interactions

- Detrimental/Harmful
  - Parasites
    - ✓Batbugs-can be confused with bed bugs
  - Structural damage
    - ✓Bat urine can be corrosive to wood
  - Contamination
    - ✓Ammonia from urine
  - Fear

Bed bug (left) and bat bug (right)

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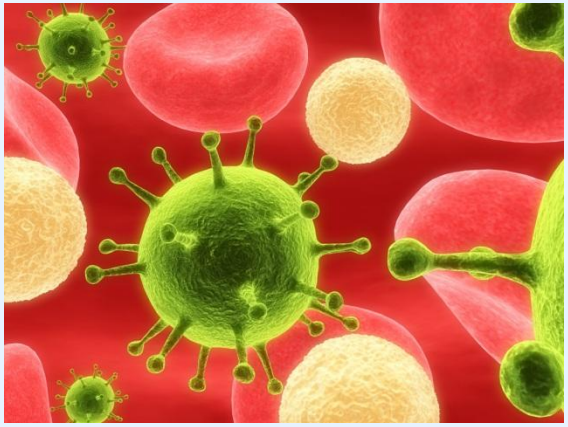
Human-Bat Interactions

- Detrimental/Harmful
  - Diseases
    - ✓Fungal: Histoplasmosis--found in bat guano. Risk highest in confined areas with large amounts of guano
    - ✓Viral: Rabies--however, other animals, such as skunks and raccoons, have a much higher incidence of rabies than bats



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Bats As Rabies Vectors

- Vast majority are rabies free
- Isolated or downed bats have a higher rate of rabies
- People can be bitten and not know it!

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Nebraska Bat Rabies Exposure Protocols

- Assume person was bitten if
  - He or she awakes with bat in room
  - Bat found in room with someone unable to communicate well, i.e. children, intoxicated, mental impairment
  - Any physical contact occurred with bat
  - DO NOT RELEASE BAT
  - DO NOT DAMAGE BAT'S HEAD

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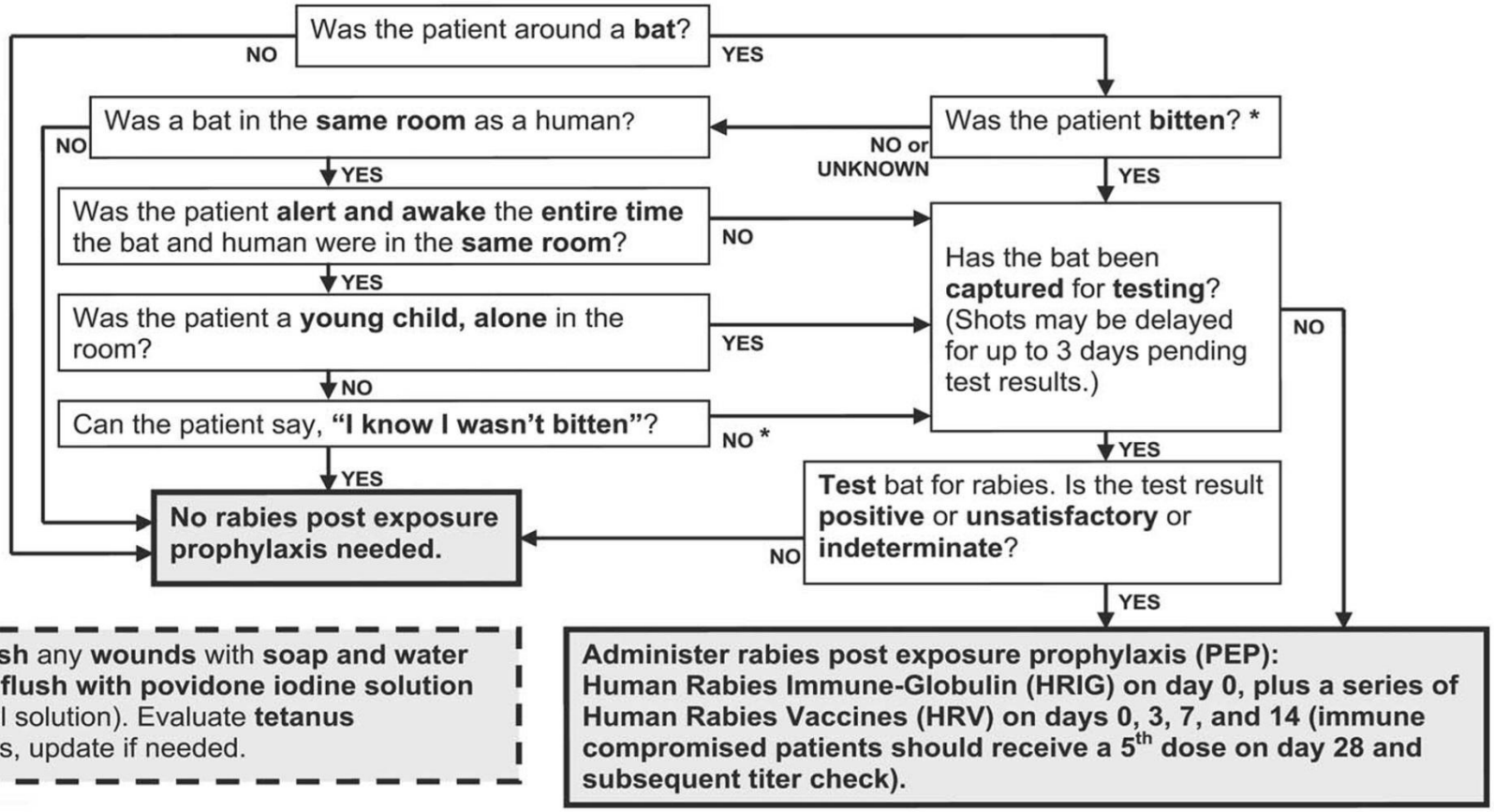
Rabies Exposure Management for Bat-related Incidents



Nebraska Department of Health and Human Services
Division of Public Health
Office of Epidemiology
(402) 471-2937

Department of Health & Human Services
DHHS
NEBRASKA

*Based on the algorithm, "Bat Exposure: Rabies Exposure Management for Bat-related Incidents," developed by the Iowa Department of Public Health (http://www.idph.state.ia.us/Cade/Rabies.aspx), accessed August 29, 2011.

Capture of Lone Flying Bat

- Close exits & hiding places to restrict movement
- Watch bat while waiting for it to tire and land
- Do NOT hit with a tennis racquet
- Don't stand in middle of room
- Capture bat
- Contact Health Dept. to have bat tested: 402-471-2937

Photo: University of Nebraska–Lincoln

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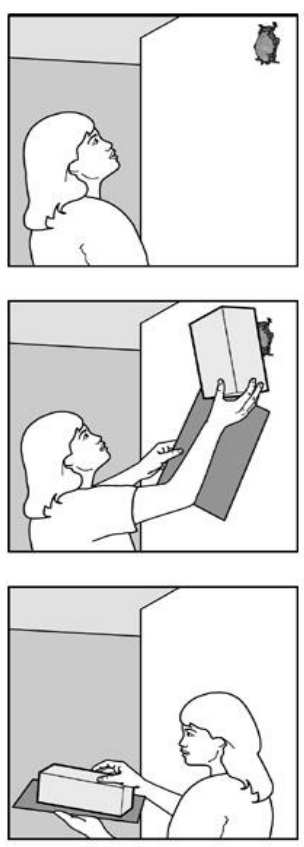
Capture of Lone Resting Bat

- Put on thick gloves
- Get a glass, cup, or plastic container
- Approach slowly and put the container over the bat
- Slide a piece of cardboard between the container and wall. Secure the container.
- Consult residents of the structure to determine possible exposure to the bat. Consult with Nebraska Health (402-471-2937) Dept. about need for testing bat for rabies.



Drawing: © David Chapman, Bat Conservation International

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Safely Releasing a Bat

Drawing: University of Nebraska–Lincoln

If you are <u>certain</u> there was no exposure to the bat according to Nebraska Protocols, the bat may be released.

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Safely Releasing a Bat

- Place bat on tree branch or trunk as high as possible. The elevation will help it get airborne when it decides to fly
- DO NOT place bats on the ground as they have difficulty flying from the ground and they are at risk of encountering children and pets.

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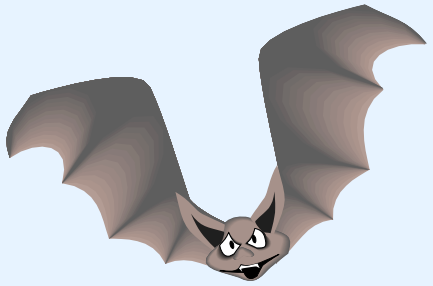
Removal of Lone Bat



- For single bat in a room with no exposure
  - Open all windows and doors in the room where the bat is observed (see rabies protocols)
  - Block doors leading to adjoining rooms
  - Leave lights on and stand motionless
  - Let the bat fly around looking for an escape route, it will most likely find its way out on its own (Watch the bat leave!!!!)
  - Do not swat at the bat!

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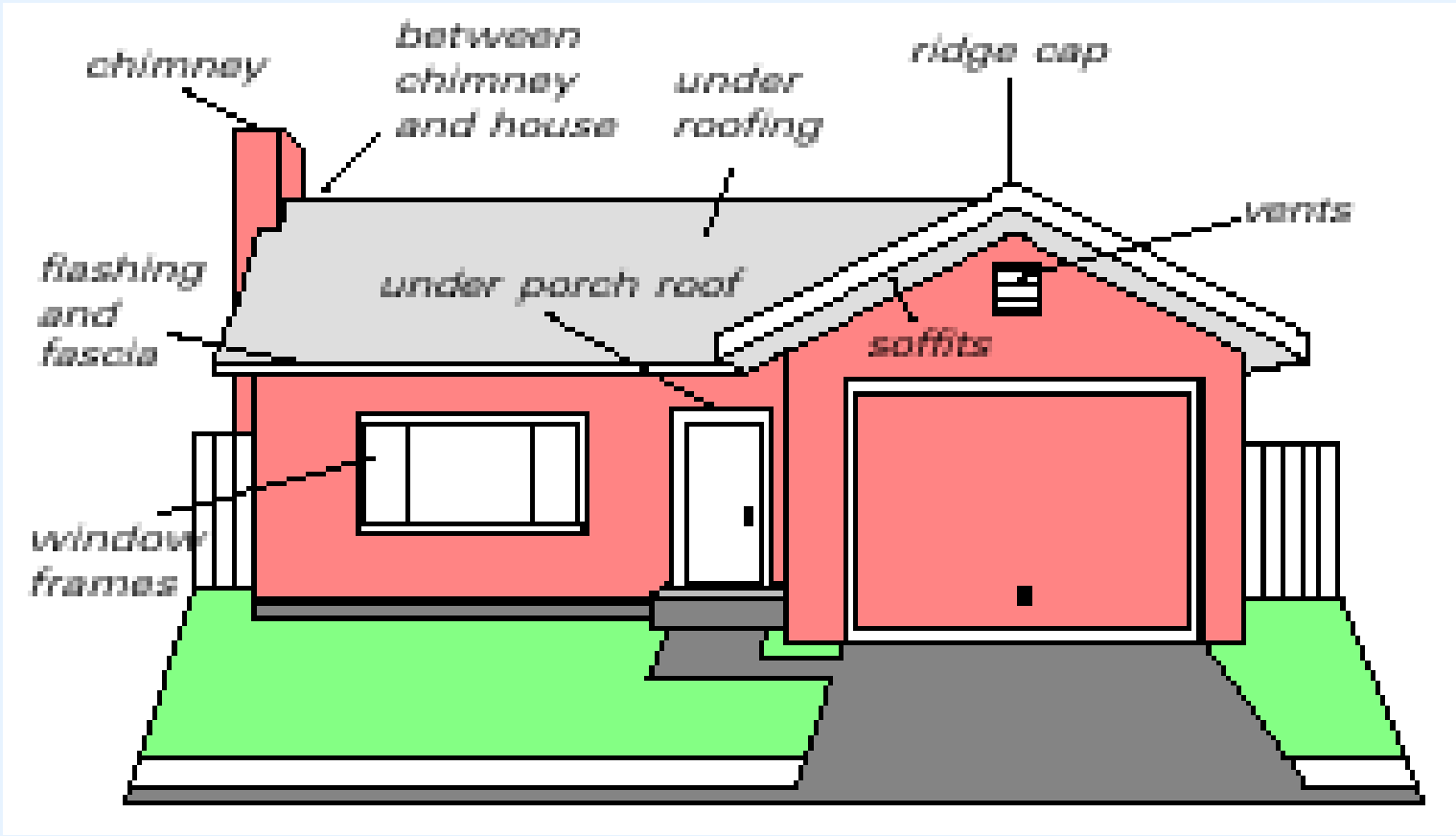
Bat Inspections



Typical Entry Points

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Bat Infestation Signs

How to know if bats are resident in your home!

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Inspection—NO, NO, NO

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PPE—Yes!

- Protect yourself before entering spaces where guano may be present
- Get fit-tested before using a HEPA-filter mask.
- Improper use of a mask can result in physical injury.
- Wear gloves too.

Wear a HEPA-filtering mask before entering locations where guano may be present.

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Bat Infestation Signs

- Single bat in the summer, consider it an accidental entry.
- Finding two bats in the summer, assume it is an infestation.
- Bat found in winter means bats are hibernating in your building.
- Finding a single bat every year, suggests infestation in home.

Bats hanging on outside of attic vent screen.

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Bat Infestation Signs

- Bat droppings inside structure suggests infestation, etc.
  - Check if droppings are fresh by placing a newspaper over the pile.
- Frequent sightings of bats around structure should raise suspicion.
- Repeated sightings of droppings on the outside of the building should raise suspicion.

Bat droppings

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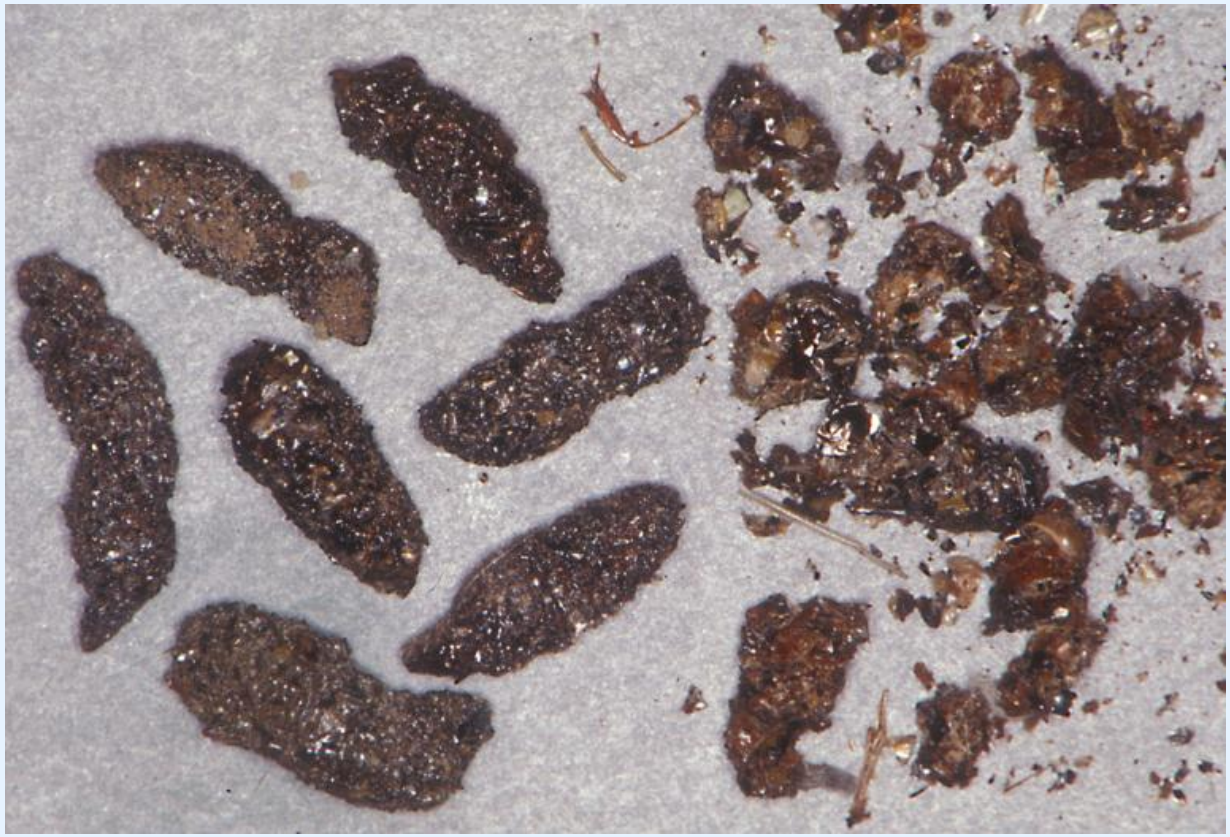
Bat Scat (Guano)

Photo: University of Nebraska–Lincoln Department of Entomology



Note the speckles and insect parts

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Mouse vs Bat Droppings

- Mouse Droppings
  - Scattered
  - Hard-when dry
  - Pointed end
- Bat Droppings
  - Soft/crumbly-when dry
  - Speckled
  - Blunt ends
  - Piled


Photo: University of Nebraska–Lincoln

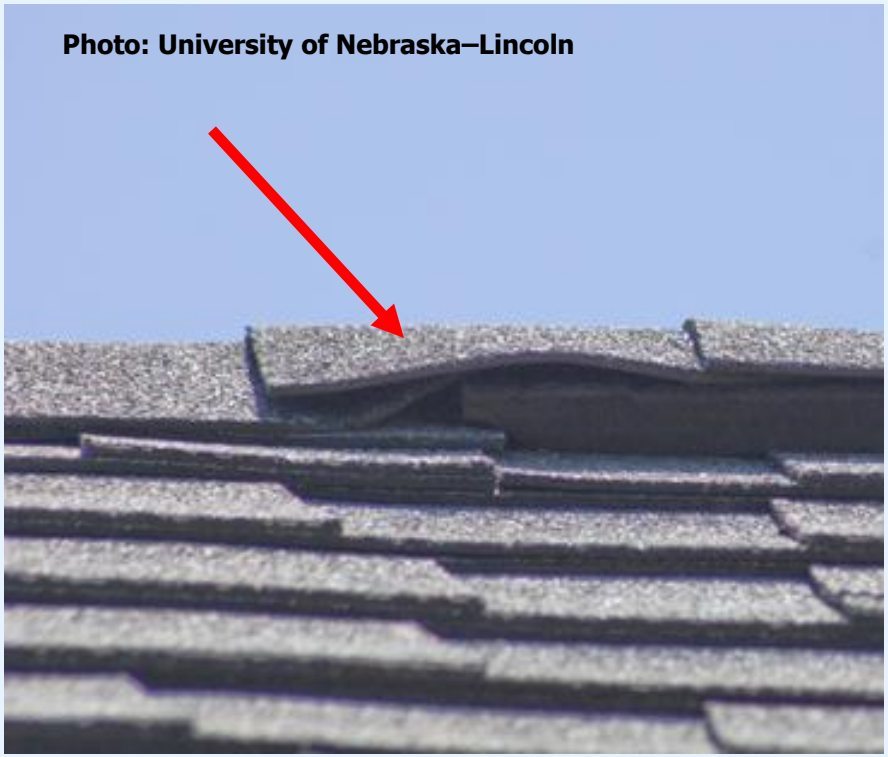

Photo: University of Nebraska–Lincoln

Bat droppings

- Bat droppings can contain spores that cause histoplasmosis. Avoid disturbing droppings or breathing the resultant dust.
- Learn more at http://icwdm.org


Photo: University of Nebraska–Lincoln

Bat Infestations in Structures



- Bats sometimes accidentally find way in while seeking shelter or feeding on insects near entryway.
  - Can enter through 3/8-inch openings
  - Cannot make their own entry holes

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Bat Colony Removal

- Bats do not have to be killed to eliminate them from a structure.
- Excluding bats from your structure involves the same process whether you have 1 or a 1,000 bats


Photo: James F. Parnell, eNature.com

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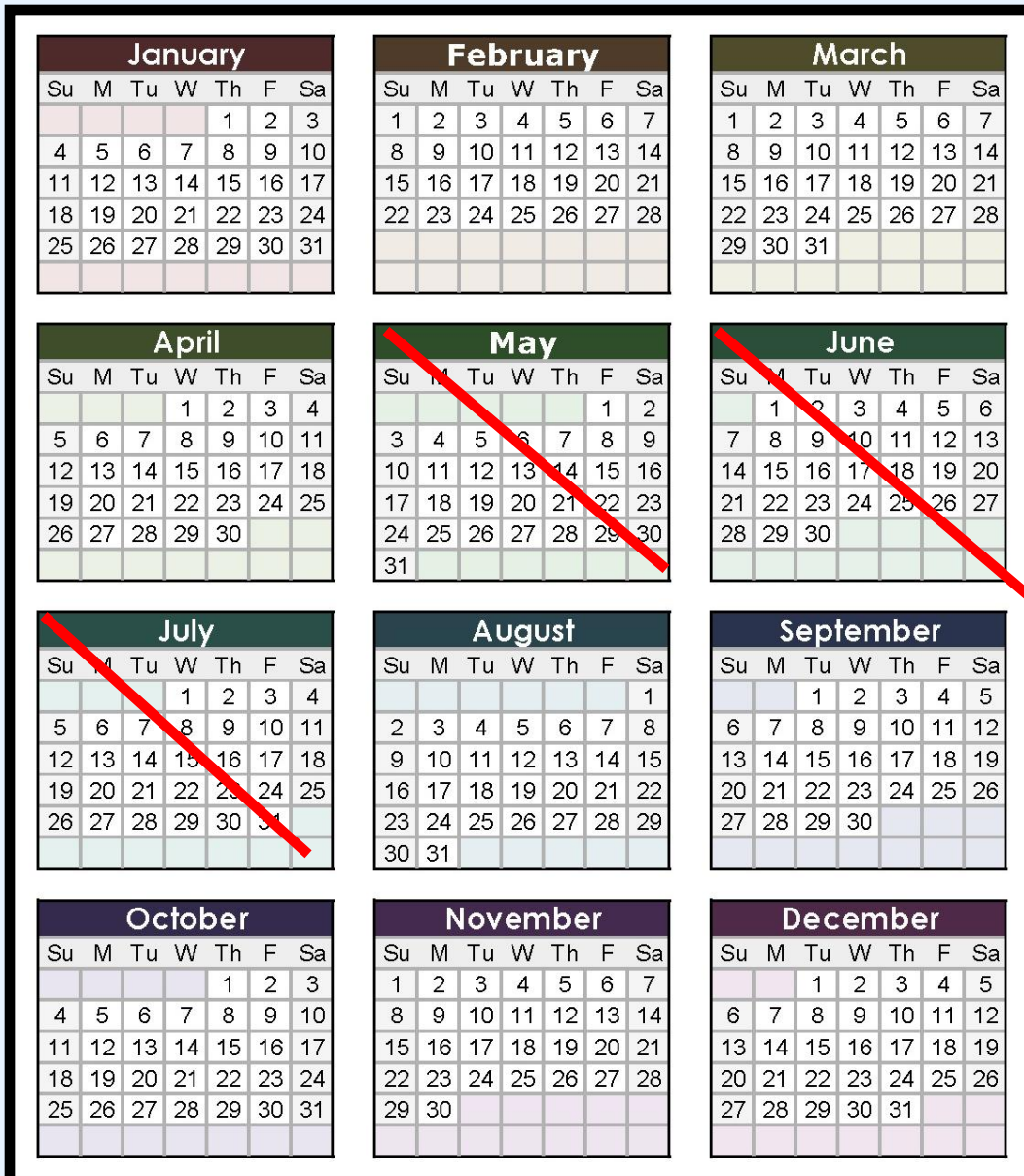
Check the Calendar

- May to July, let them fly!
- Timing is very important so don't evict during these months to prevent young from dying



January

Su	M	Tu	W	Th	F	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

February

Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

March

Su	M	Tu	W	Th	F	Sa
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April

Su	M	Tu	W	Th	F	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May

Su	M	Tu	W	Th	F	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

Su	M	Tu	W	Th	F	Sa
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July

Su	M	Tu	W	Th	F	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

Su	M	Tu	W	Th	F	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September

Su	M	Tu	W	Th	F	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
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27	28	29	30			

October

Su	M	Tu	W	Th	F	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

November

Su	M	Tu	W	Th	F	Sa
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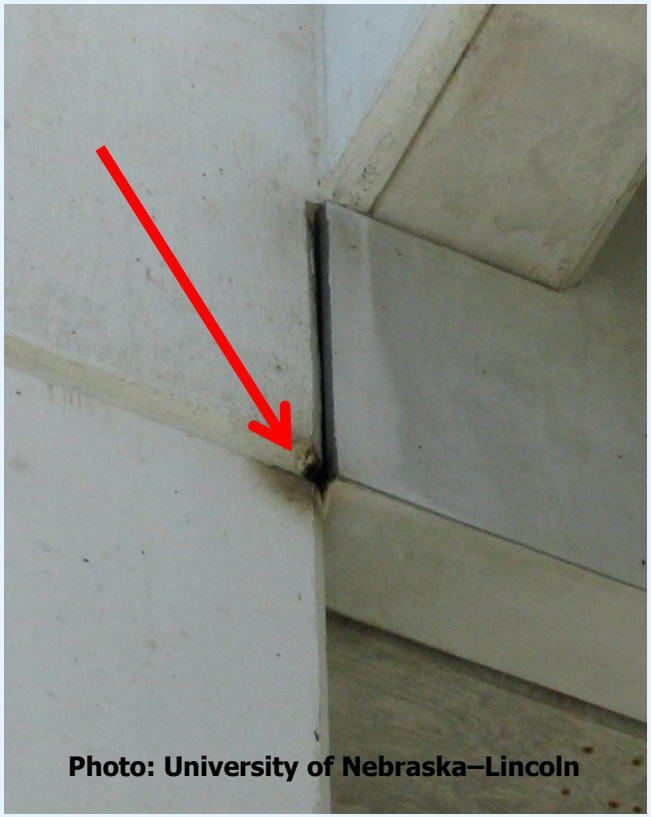
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

December

Su	M	Tu	W	Th	F	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Bat Colony Exclusion

- For bats already residing in a structure:
  - During the evening, go outside to observe/inspect where bats are entering and exiting
  - Begin watching at dusk on a clear night. Have 1 person at each corner of the building.
  - Look for bats
  - Watch multiple nights to narrow down key exit points.
  - Confirm locations by inspecting during the day with ladders.
  - Look for guano and rub marks



Notice the brown smudge marks at this gap in the concrete

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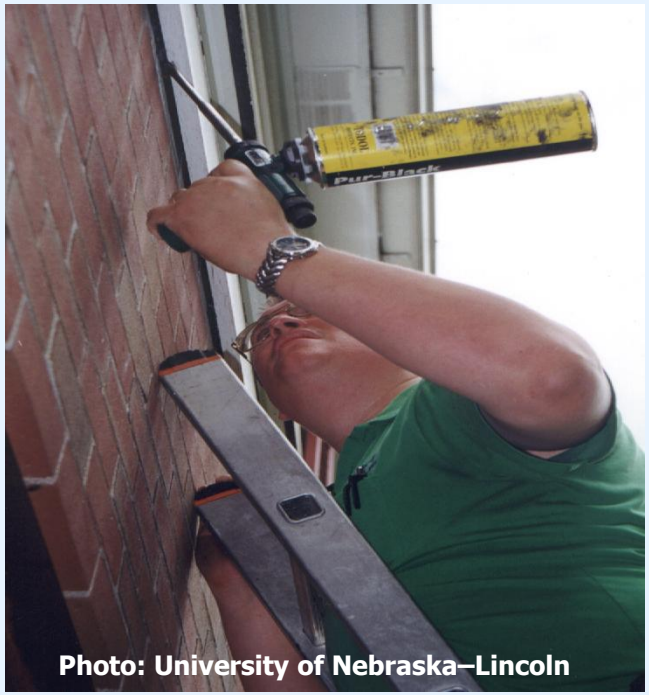
Bat Colony Exclusion

- For bats already residing in a structure:
  - Create one-way door by hanging one ft strips of flexible ½ inch netting over each possible entry and exit points
  - Fasten netting by the top edge above the entries
  - Secure all other gaps and crevices with appropriate sealant (not expanding foam).
  - Leave doors up for a week. Continue to monitor. Caution sometimes bats get spooked and will enter the living area.
  - Remove one-way doors and seal all the entry points.
  - Do not install one-way doors or seal entry points during May-July when young bats may be in the roost "May-July let them fly"

Bat-proofing buildings

- Close unused holes $\frac{3}{8}$-inch diameter or greater.
- Close any unused cracks of at least a $\frac{1}{4}$ inch by $1\frac{1}{2}$ inch.
- Use window screens, chimney caps, and draft-guards beneath doors to attics
- Use stainless-steel wool or sealant to fill electrical and plumbing holes



Don't use expanding foam

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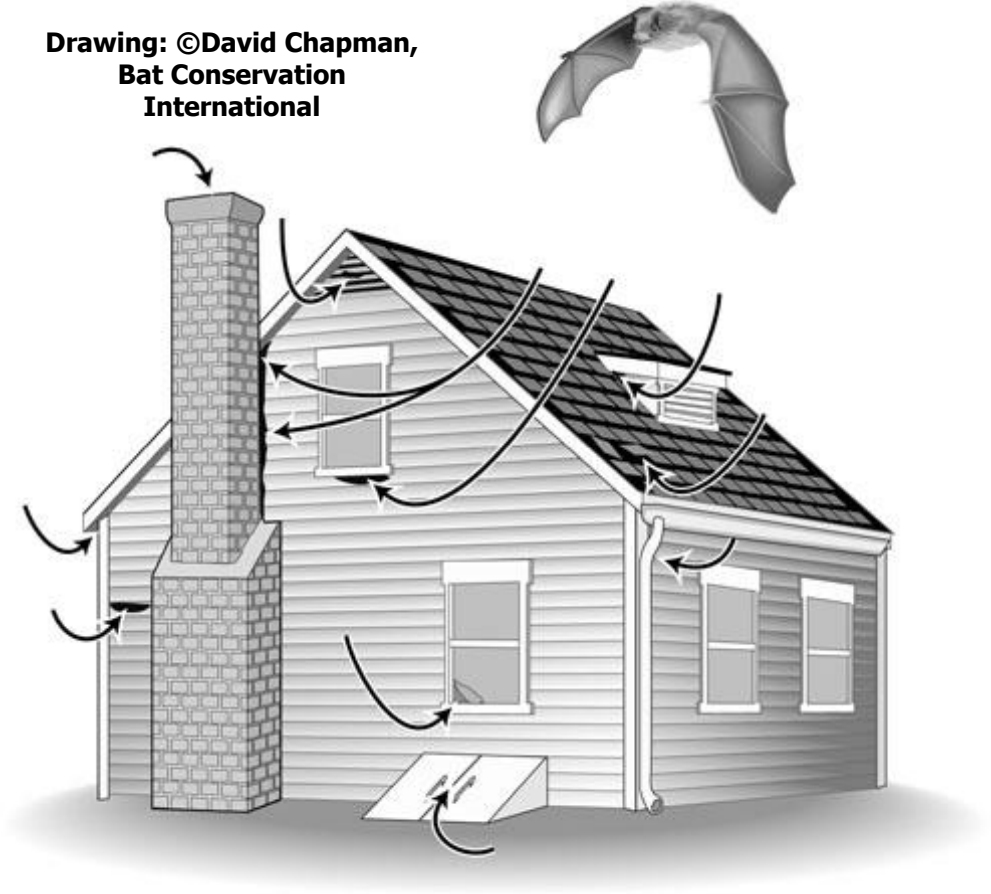
Bat Exclusion



Potential entry points for bats, including the chimney

- Install professionally manufactured stainless steel chimney cap to reduce the likelihood of bats roosting in chimneys or entering buildings from the chimney

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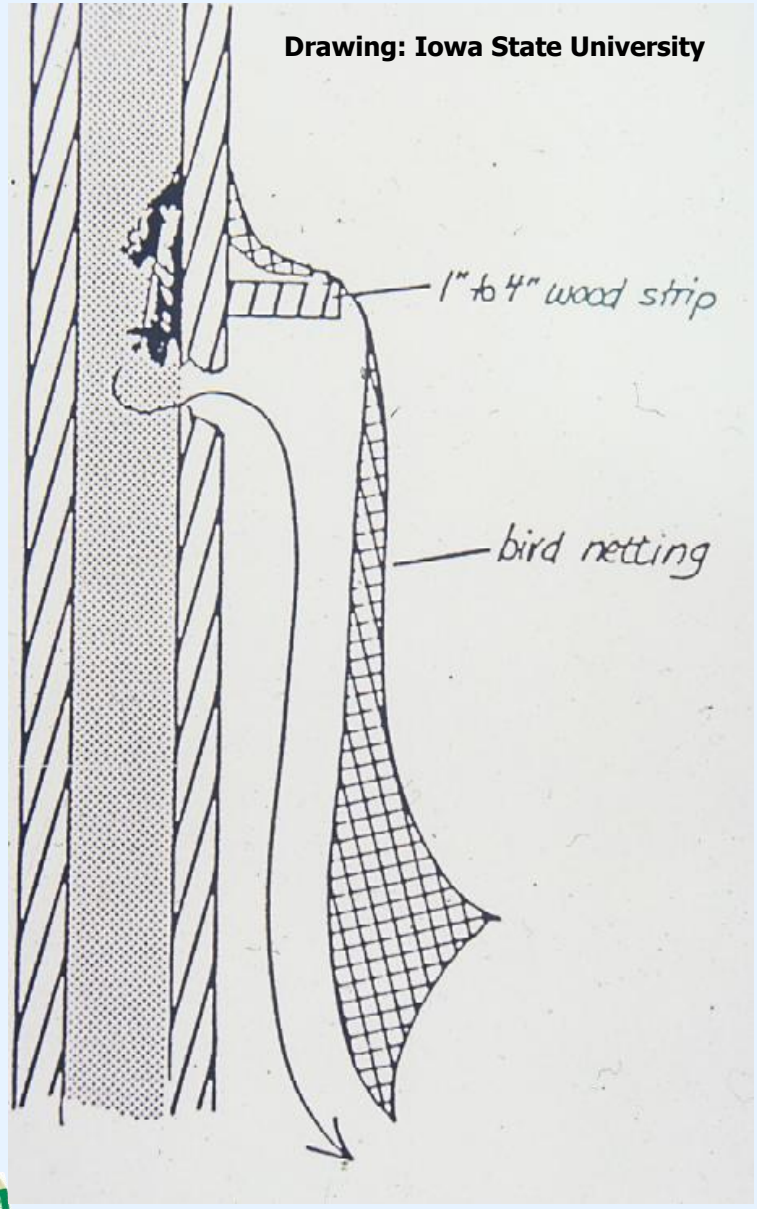

- Use netting to create a "one-way door" over bat entry and exit points.

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Preventing Bat Problems

- Keep screens and doors tightly closed
- Plug holes using products such as weatherproof foam strips and foaming aerosol insulation or exterior caulk.
- Reduce insect populations around doors by replacing regular light bulbs with yellow "bug lights"
- Fill gaps before they get to $\frac{1}{4}$-inch wide.

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Repellents

- Commercial products such as Bat-A-Way have questionable effectiveness and have not been tested on Nebraska bats
- Mothballs and ultrasound devices have not been proven effective

Photo: University of Nebraska–Lincoln

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Poisons and Toxicants

- No toxicants registered for bats in Nebraska or the U.S.
- Would be hard to bait since they eat live insects

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Bat Houses

- Roughen the interior to allow the bat to climb
- Paint a dark color
- Fasten to the south side of poles, trees, or buildings at 12-18 ft above the ground
- Locate where animals such as cats, raccoons, owls, or other predators can't get to it

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Bat Houses

Single chambered bat house which still needs painting and mounting.

For more bat house information visit http://icwdm.org

Bat Houses

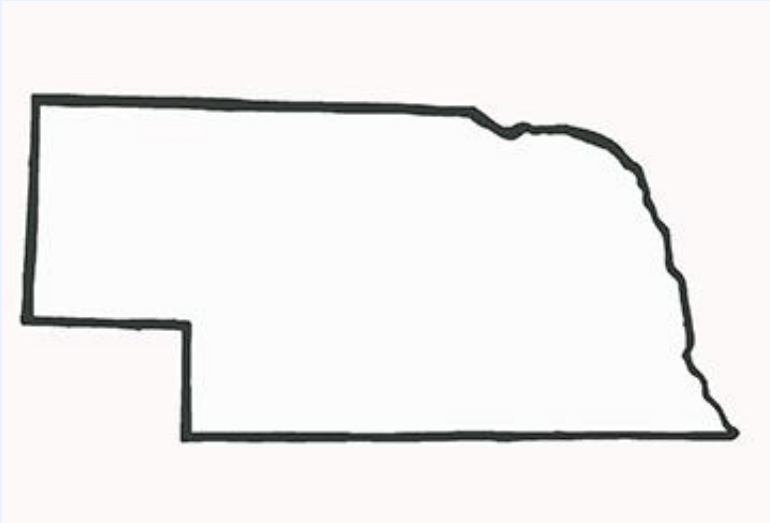

Photo: University of Nebraska–Lincoln

Do not install bat houses on trees where they don't receive 8 hours of sun.

For more information on bat houses visit http://icwdm.org

Bat Conservation

- White-nose Syndrome (WNS) is a fungal infection that is killing tens of thousands of bats.
- Some species may become threatened or endangered
- Has it reached Nebraska's bats?
- No! But it might.



White-nose Syndrome has not yet reached Nebraska's bats.

Bat Conservation

- Avoid killing bats unnecessarily
- Do not reuse bat exclusion materials unless they have been properly cleaned to prevent the spread of the fungus

Resources/Information

- Bat Conservation International
  - http://www.batcon.org
- Internet Center for Wildlife Damage Management
  - http://icwdm.org
- Prevention and Control of Wildlife Damage
  - http://icwdm.org

University of Nebraska Lincoln

Credits

- Content Specialist
  - Stephen M. Vantassel, Nebraska Extension
  - Dennis Ferraro, Nebraska Extension
- Content Editor
  - Erin Bauer, Nebraska Extension
- Photos
  - Dennis Ferraro, Nebraska Extension
  - Stephen M. Vantassel, Nebraska Extension

University of Nebraska Lincoln

Credits

- Photos
  - Bat World Sanctuary (http://www.batworld.org)
  - Merlin D. Tuttle, Bat Conservation International
  - U. S. Fish and Wildlife Service
  - Jim Kalisch, UNL Department of Entomology
  - Nebraska Health and Human Services
  - WNC Nature Center
  - James F. Parnell, eNature.com

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Credits

- Photos
  - Erin Bauer, Nebraska Extension
- Artwork
  - David Chapman, Bat Conservation International

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