

## **Appendix 1.** Items of all reported measures.

### Pride

When I think about my participation in the “Bat Researchers” project, ...

1. ... I am proud of myself.
2. ... I am very satisfied with myself.
3. ... I feel confident.

### Attitudes toward bats

1. Bats are impressive animals.
2. Bats need to be protected.
3. I get excited about having bats near my house/flat (e.g., below the roof top).
4. Bats are intelligent animals.
5. We need to promote the protection of bats.
6. Bats are dangerous animals.
7. Habitats of bats near my house/flat (e.g., old houses, dead trees) should be kept.
8. Bats carry severe germs.
9. Bats are fascinating animals.
10. Bats are threatening animals.
11. Bats do not belong to people’s close surroundings.
12. It is important to better protect bats.

### Attitudes toward engagement in CS

1. I think that citizen science projects make sense.
  2. I want to participate in further citizen science projects.
  3. Participating in citizen science projects is easy for me.
  4. I want to engage in future citizen science projects.
  5. Citizen science projects help me understand the world around me.
  6. I consider citizen science projects a good cause.
  7. I want to continue to learn something in further citizen science projects.
  8. I can manage even difficult situations in citizen science projects.
  9. Citizen science projects help me protect the environment.
  10. People in my direct surroundings engage in citizen science projects.
  11. Citizen science projects help me make better choices about my health.
  12. I think that citizen science projects get us somewhere.
  13. It is normal for people in my direct surroundings to talk about citizen science projects.
  14. It is easy for me to try to understand new topics of citizen science projects.
  15. Other people in my direct surroundings are also enthusiastic about citizen science projects.
- Attitudes: 1., 6., 12.; Intentions: 2., 4., 7.; Behavioral beliefs: 5., 9., 11.; Control beliefs: 3., 8., 14.; Normative beliefs: 10., 13., 15.

### Psychological ownership

1. The “Bat Researchers” project feels like it is mine.
2. I feel like I personally own the “Bat Researchers” project.
3. I feel like I possess the “Bat Researchers” project.

Topic-specific knowledge about bats

1. Which statement about reproduction in bats is correct? (one answer is correct)
  - A. Fertilization occurs immediately after mating in bats.
  - B. The female bat moves into roosts alone after mating.
  - C. Bats have 1-2 young per year.
  - D. Bats mate in spring.
  
2. Which statement about raising young in bats is correct? (one answer is correct)
  - A. Bats build nests for their young.
  - B. Bats feed insects to their young.
  - C. Bats lay eggs.
  - D. Bats lactate their young.
  
3. What is the risk of being bitten by a bat? (one answer is correct)
  - A. Bats can bite, but their small teeth cannot hurt human skin.
  - B. Bats can bite, but thick gloves protect you.
  - C. Bats will bite if you enter an attic or basement where bats are present.
  - D. Bats will bite if you enter the territory of a bat roost in the woods.
  - E. Bats will bite when they mistake a human finger for prey.
  
4. What possible danger could bats pose to/in your building? (one answer is correct)
  - A. The acid in bat droppings could damage the masonry.
  - B. A bat roost could expand largely in a building.
  - C. Bats can bite if you touch them.
  - D. Dropped young bats may behave aggressively.
  - E. Young bat may accidentally get lost into living rooms in the spring.
  
5. Assign the habitats of bats to their respective functions (one assignment per habitat).
  - (1) Tree holes and cracks
    - Hunting and drinking
    - Foraging and orientation
    - Foraging and migration
    - Day roosts
  - (2) Open area
    - Hunting and drinking
    - Foraging and orientation
    - Foraging and migration
    - Day roosts
  - (3) Waterbodies
    - Hunting and drinking
    - Foraging and orientation
    - Foraging and migration
    - Day roosts
  - (4) Caves and rock cracks
    - Hunting and drinking
    - Foraging and orientation
    - Foraging and migration
    - Day roosts
  - (5) Vegetation edges
    - Hunting and drinking

Foraging and orientation  
Foraging and migration  
Day roosts

6. Which statements about the impact of urban growth on bats are CORRECT or FALSE?
- A. Building development in cities has an impact on bats because bats find roosts in and at buildings at all times of the year.
  - B. Tall buildings have an impact on bats because bats hunt in open areas.
  - C. Artificial light in cities does not affect bats because it does not affect their echolocation.
  - D. Roads have no effect on bats because bats can fly over them.

7. In what types of roosts can bats live in the city?
- A. Tree cracks
  - B. Burrows
  - C. Buildings
  - D. Nesting boxes
  - E. Home-made nests

8. Which statements about the respective habitat of the four bat groups can be derived from the diagram? Complete the sentences (one bat group per statement).

*[Figure available upon request by the authors.]*

(1) Bats of group a

have advantages from man-made structures (e.g., light sources), but also use natural habitats (peri-urban specialists).  
cope only in rural areas and not in urban areas (urban sensitive/avoidant bats).  
cope in rural as well as urban and peri-urban areas (urban-tolerant bat species).  
benefit more from urban than from rural habitats (urban specialists).

(2) Bats of group b

have advantages from man-made structures (e.g., light sources), but also use natural habitats (peri-urban specialists).  
cope only in rural areas and not in urban areas (urban sensitive/avoidant bats).  
cope in rural as well as urban and peri-urban areas (urban-tolerant bat species).  
benefit more from urban than from rural habitats (urban specialists).

(3) Bats of group c

have advantages from man-made structures (e.g., light sources), but also use natural habitats (peri-urban specialists).  
cope only in rural areas and not in urban areas (urban sensitive/avoidant bats).  
cope in rural as well as urban and peri-urban areas (urban-tolerant bat species).  
benefit more from urban than from rural habitats (urban specialists).

(4) Bats of group d

have advantages from man-made structures (e.g., light sources), but also use natural habitats (peri-urban specialists).  
cope only in rural areas and not in urban areas (urban sensitive/avoidant bats).  
cope in rural as well as urban and peri-urban areas (urban-tolerant bat species).  
benefit more from urban than from rural habitats (urban specialists).

9. Which TWO characteristics do winter roosts for bats in the city definitely require? (TWO answers are correct)

- A. Roosts must be rather dry, like rooms with heating systems.

- B. Roosts must be frost-free, like basements.
- C. Roosts must provide enclosed hanging places, such as narrow crevices.
- D. Roosts must be quiet.
- E. Roosts must be able to warm up easily, such as attics.

10. Bats inhabit different roosts, which differ in their function. Which statement about roosts of bats is true? (one answer is correct)

- A. After mating, summer roosts are used by both female and male bats.
- B. Roosts where females raise young are called nurseries.
- C. Summer roosts are often also used as winter roosts.
- D. Winter roosts are used by female and male bats.

11. Which of the following does NOT have a direct impact on bats using roosts? (one answer is correct).

- A. Protect tree cavities
- B. Put up feeding places
- C. Create diversity in the garden
- D. Avoid pesticides

12. What is the most LIKELY consequence bats can have in a building? (one answer is correct)

- A. Bats bring nesting material into their roost.
- B. Bats leave droppings in their roost.
- C. Bats nibble on house insulation.
- D. Bats spread parasites such as lice and ticks.
- E. Bats enlarge existing cracks in house facades.

13. Why do bats benefit from a near-natural garden with many different plant species? (one answer is correct)

- A. A semi-natural garden with many different plant species provides more hiding places.
- B. A semi-natural garden leaves more fruit from many different types of plants.
- C. In a semi-natural garden, the flowering times of the different plant species attract more insects.
- D. In a near-natural garden with many different plant species, there is less chemical exposure to pesticides.

14. Why can putting up bat boxes be helpful for bats? (one answer is correct)

- A. Bat boxes provide opportunities to bats to explore new hunting areas.
- B. Bats settle in new areas because of bat boxes.
- C. Bat boxes create additional roosts.
- D. Bat boxes facilitate nest building for raising young.

15. Which TWO factors do you need to consider when putting up a bat box? (two answers are correct)

Putting up a bat box is done ...

- A. ... protected behind trees.
- B. ... in larger numbers.
- C. ... in northern orientation.
- D. ... with different types of boxes.
- E. ... like a bird box.

F. ... for cleaning purposes at chest level.

16. Bats are endangered throughout Germany and need our help and protection in cities as well. Which of the following does NOT help protect bats? (one answer is correct)

- A. Increasing plant diversity in allotments enhances the foraging habitat of bats.
- B. Avoiding the use of wood preservatives reduces the risk of bats becoming ill in their roosts.
- C. Avoiding insecticides maintains the food base of bats.
- D. Supplementary feeding with mealworms bridges the winter period for bats.

17. Which of these factors influences whether or not a bat will accept a bat box? (one answer is correct)

- A. Bats will only accept bat boxes if they are placed at least 10 m above the ground.
- B. Bats prefer different boxes depending on the species.
- C. Depending on their origin, bats prefer different boxes.
- D. Depending on their age, bats prefer different boxes.
- E. Female and male bats prefer different bat boxes.

18. Why do wind turbines pose a threat to bats? (one answer is correct)

- A. Wind turbines and the pressure of the rotor blades push bats to the ground.
- B. Wind turbines are especially dangerous to young bats.
- C. Wind turbines injure the internal organs of bats.
- D. Wind turbines injure male bats during hunting.
- E. Only bat species that migrate between summer and winter roosts are injured by wind turbines.

19. Which statement about the protection of bat roosts in buildings is true? (one answer is correct)

- A. If a bat roost is in and at the façade of a building, the entire building is protected.
- B. Protection applies to buildings with consistently occupied bat roosts.
- C. Bat roost protection is based on population size.
- D. Bats in and on the building are subject to a year-round disturbance ban.
- E. Bat roosts shall be protected in buildings only for the duration of hibernation.

20. Which of these statements is a CORRECT or FALSE justification for the need to protect bat roosts?

- A. Bats have few offspring, so disturbance is particularly severe.
- B. Summer roosts are visited only once by the same bat, but regularly by different bats.
- C. If bats are disturbed in their winter roosts, they will not mate in the spring.
- D. When bats are disturbed in the maternity roost, there is a risk that young will be left behind.

21. Which legal basis must you consider if you encounter bats on your property? (one answer is correct)

- A. Dead animals are excluded from the law.
- B. Abandoned roosts may be sealed.
- C. Injured, helpless, or sick animals must be reported.
- D. Violations of shelter regulations are punishable only as misdemeanors.

22. On average, what percentage of their own body weight do bats ingest in food each night?  
(one answer is correct)

- A. 5%
- B. 15%
- C. 20%
- D. 30%
- E. 50%

23. How many species of bats are found in the city of [blinded for review]? (one answer is correct)

- A. 3
- B. 9
- C. 12
- D. 18
- E. 20

24. Which bat species are native to Germany and which are not?

*[Figure available upon request by the authors.]*

- A. Fringed-lipped bat
- B. Grey long-eared bat
- C. Common noctule
- D. Short-tailed leaf-nosed bat
- E. Barbastelle bat
- F. Vampire bat
- G. White bat
- H. Pipistrelle bat

25. Name the body parts of the bat by matching the numbers with the appropriate label from the list.

*[Figure available upon request by the authors.]*

(1) 1

2nd finger  
Thumb claw  
Flight skin  
Hind foot  
Ear  
Tragus  
Forearm

(2) 2

2nd finger  
Thumb claw  
Flight skin  
Hind foot  
Ear  
Tragus  
Forearm

(3) 3

2nd finger  
Thumb claw  
Flight skin  
Hind foot

- Ear
- Tragus
- Forearm
- (4) 4
  - 2nd finger
  - Thumb claw
  - Flight skin
  - Hind foot
  - Ear
  - Tragus
  - Forearm
- (5) 5
  - 2nd finger
  - Thumb claw
  - Flight skin
  - Hind foot
  - Ear
  - Tragus
  - Forearm
- (6) 6
  - 2nd finger
  - Thumb claw
  - Flight skin
  - Hind foot
  - Ear
  - Tragus
  - Forearm
- (7) 7
  - 2nd finger
  - Thumb claw
  - Flight skin
  - Hind foot
  - Ear
  - Tragus
  - Forearm

26. Which behavior is the CORRECT thing to do when you want to protect bats in your home? (one answer is correct)

- A. Feed bats insects.
- B. Do not disturb bats.
- C. Pay no further attention to bats.
- D. Check bat roosts regularly.
- E. Keep bat roosts warm and dry.

27. How can bats be supported during hibernation? (one answer is correct)

- A. Bats build nests for hibernation and therefore should be supported by bat boxes.
- B. Bats need protected winter roosts and should therefore be translocated to such roosts.
- C. Bats find little food in winter and therefore should be given supplementary feeding.
- D. Bats require energy when waking from hibernation and therefore should not be disturbed.

28. What measures for living harmoniously together with bats in buildings are ACCEPTABLE or NOT ACCEPTABLE for all citizens?

- A. Seal entrance and exit openings
- B. Install droppings boards
- C. Contact conservation authority
- D. Relocate non-protected species
- E. Scaring away by, for example, aluminum strips

29. Which of these statements about bats are CORRECT or FALSE?

- A. During their fast flight maneuvers, bats can get caught in people's hair.
- B. The saliva of some bat species prevents blood clotting.
- C. Bats always fly out of their roosts to the left.
- D. Bats can locate obstacles no thicker than a human hair.
- E. Bats have similar vision to other mammals.
- F. Bats are rodents.
- G. Bats rely only on their echolocation when flying.
- H. Some bat species feed on human blood.
- I. Vampire legends derive from vampire bats.