

# Harbor Porpoises of Puget Sound

## Key for Quizzes and Worksheet



Puget Sound Research,  
Conservation & Education



### **This Packet Contains:**

**Pre/Post-Quiz Key**

**Video Worksheet Key**

**Digging Deeper Possible Answers**





# Pre/Post-Quiz Key

1. Which of the following species is small, found throughout the Salish Sea, and needs to feed more consistently than other species?

**a. Harbor porpoise**

2. Behaviors of most creatures can be attributed to which two primary motivators (e.g. what do they need for survival the most)?

**c. Food and shelter**

3. Harbor porpoises were all but gone in the Puget Sound in which time period?

**answer: request from Made In Puget Sound**

4. What technique is used by many marine mammal researchers to identify individuals without touching/harming the animals?

**answer: request from Made In Puget Sound**

5. Which of the following has the shortest life-span?

**answer: request from Made In Puget Sound**

6. (\_\_\_\_\_) is the term for how dolphins and porpoises use sound to find food.

7. What is unique about harbor porpoise vocalizations?

**answer: request from Made In Puget Sound**

8. Which of the following is a difference between porpoises and dolphins?

**answer: request from Made In Puget Sound**

9. What is the term for the behavior when a whale, dolphin or porpoise lunges at the surface, causing water to spray up on both sides, while chasing a fish?

**answer: request from Made In Puget Sound**

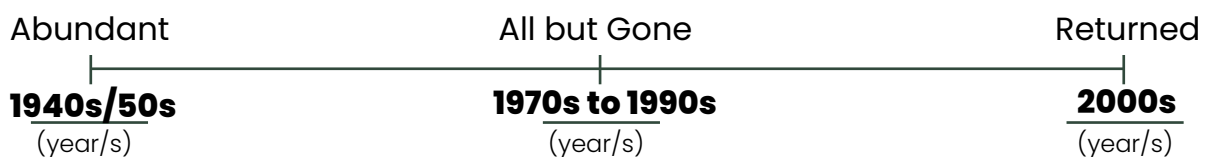
10. Why are harbor porpoises and harbor seals more susceptible to the effects of human actions that happen on land than other marine mammals?

**answer: request from Made In Puget Sound other marine mammals**



# Video Worksheet Key

1. What two species of marine mammal does Pacific Mammal Research study? **answer: request from Made In Puget Sound**
2. Name one reason that collaboration between research scientists is important. **answer: request from Made In Puget Sound**
3. Name the three things that harbor porpoises do in Burrows Pass (PacMam's study site) that make it biologically important for them.  
**answer: request from Made In Puget Sound**
4. Describe why harbor porpoises need food more consistently than other marine mammals. **answer: request from Made In Puget Sound**
5. Researchers know that individual harbor porpoises return to the study site, what technique do they use for identification?
6. Name the two primary motivators that help shape the behavior of most animals (e.g. what do they look for/need the most?).
7. Name 2 ways that the Strait of Juan de Fuca influences the environment in Burrows Pass that benefits the organisms there.
8. Describe the timeline for harbor porpoises in the Salish Sea – when were they abundant, all but gone, and returned?
9. What factors may have influenced their disappearance and return?
10. Name three things that are recorded in the field by researchers.



11. Why was finding a land-based study site important for researching harbor porpoises?
12. What is it called when a harbor porpoise chases a fish at the surface (lunging at the surface)?
13. When researchers see harbor porpoises doing aerial behavior, what is most likely happening, and which sex (male or female) is jumping out of the water?
14. How long do porpoises live (is this shorter or longer than for dolphin species) and when do they become sexually mature?
15. Female harbor porpoises can be \_\_\_\_\_ and \_\_\_\_\_ each year (or every other year), which increases their energetic needs and thus the food that they require.
16. Why are gulls helpful when photographing harbor porpoises?
17. Name 2 differences between dolphins and porpoises.
18. How do porpoises sleep and how does this relate to the fact that they are conscious breathers?
19. How do porpoises use sound to find food? (specifically what is the term and how does it work?)
20. Harbor porpoises vocalize in the high frequency range (which we have only more recently been able to record with new technology); why is it thought that they evolved this adaptation?
21. What is the nickname for the harbor porpoise due to their loud exhalation?
22. What is the average size for a harbor porpoise?
23. A harbor porpoise is a top predator – why are animals like these more susceptible to issues like pollution, and how does it affect their health?
24. What about harbor porpoise and harbor seal ecology makes them more susceptible to what humans do on land than other marine mammals?

25. Why is it important to know more about the biology, behavior and ecology of harbor porpoises in relation to climate change and other anthropogenic (human) impacts?

## Question 1:

Harbor porpoises eat herring (one of many species they eat), herring eat phytoplankton (small microscopic photosynthetic organisms). Water quality is important to phytoplankton and is influenced by water movement due, in part, to currents and tides, bringing nutrient rich water to an area. Describe how harbor porpoises would be affected if water quality and nutrient distribution significantly decreased, or even ceased, in a biologically important area for them. Remember that harbor porpoises need consistent food sources, more than other marine mammal species; how would this affect behavior? Also be sure to think about how these changes will affect other organisms in the ecosystem. Answers can include, but are not limited to: their individual and population health, behavior, ranging patterns, and interactions with other species (changing ecosystem dynamics).

**Answers will vary. Effects will be based on the fact that if phytoplankton populations crash, herring populations won't have enough food, causing their population to crash as well, which in turn means that harbor porpoises don't have enough food for good health or ultimately survival.**

### **Example possible effects (can be one or more):**

- i. Individual health declines (death due to starvation or lower fitness that leads to starvation or lowered immune system that can lead to death).**
- ii. Population declines (animals die and/or lowered reproductive rates due to lowered nutrition).**
- iii. Behavioral changes (change foraging strategy/switch prey items - which then affects the population levels of those prey and the predators that rely on them; less time to do other behaviors (like mating, socializing) that could affect population level parameters).**
- iv. Ranging patterns change. They may shift their ranging patterns to try and find more food, which will have implications for the other animals and may alter the ecosystem dynamics in that area. Possible displacement of other species, or eradication of other species could occur.**
- v. Changing ecosystem dynamics – this is covered in some of the above effects. Important for students to realize that a change in one species usually means other species will be affected as well.**

## Question 2:

Describe how humans have influenced the abundance of harbor porpoises in the past and present and how we may affect them in the future (good and bad). Think about what we know happened, and why research is needed; use that to explain possible outcomes for the future – can these lessons be used for other species and why?

**Answers may vary in detail, but should cover basic facts:**

i. Harbor porpoises were abundant before significant human interferences (up until the early 1970s)

ii. Pollution, fishing (gill nets in particular), habitat destruction (especially shoreline work) likely made the harbor porpoise population decrease to be all but gone by the 1990s (so 1970s–1990s). Harbor porpoises are top predators so they are more susceptible to pollution due to bioaccumulation and biomagnification.

iii. Increase in awareness and conservation actions during the 1980s and 1990s and beyond decreased pollution, fishing interactions and habitat destruction allowing harbor porpoises to return to their original distribution (also likely involved prey abundance changes). Healthy waters = healthy animals = healthy ecosystem. Harbor porpoise populations are doing well now.

iv. Research is required for us to better understand how species will respond to various conditions in the future, whether natural or human made. We need to understand the behavior and ecology of a species in order to predict how they will respond to their environment and changes that go along with it.

v. Future (answers can vary greatly but may include):

1. Decline can happen again if environmental protections aren't kept in place.
2. Continued protections can keep populations healthy.
3. Lack of research will reduce our ability to apply biologically important conservation measures to protect species.
4. Continued research will increase our knowledge of behavior and ecology and enable us to better protect species through conservation measures.
5. Population crashes and/or range changes in other species, will affect harbor porpoises, and other species, in predictable and unpredictable ways possibly altering ecosystem dynamics.
6. Increased human interactions (whale watch boats, boat noise, fishing, etc) may negatively affect porpoise health, behavior and ecology.
7. The harbor porpoise story can be used as a cautionary tale about what needs to be known in order to prevent a collapse like was seen for this species. We can use these lessons and apply them to any species.



### Question 3:

Think about how researchers study harbor porpoises, including what questions they want to answer, what data they collect and how they collect it. Using this information as a guide, choose a different species of interest to you. Describe what questions you would want to answer about your chosen species (and why that is important to know), explain what data you would collect in order to answer these questions, and how you would collect it. Create/describe your study and also explain how this information could be used to help protect and conserve the species (and its environment if applicable).

Lastly, conservation of a species relates to maintaining biodiversity of an ecosystem – but this is easier said than done. Think about your research topic and how this would help to maintain biodiversity in an ecosystem. Think about what constraints might hinder the use/application of the research results – this can be either scientific, economic, political, or social considerations. For example, do we have the technology and/or money to implement the research or the solution it may produce; are there any political or social obstacles (e.g. political opposition, cultural ideas that need to be addressed)? Discuss these constraints and how they may be able to be overcome.

**Answers will vary. Be sure they include why they chose that species (why it is important to know about the questions they are asking), what questions they want to answer, what data they would collect and how they would collect it. They also need to explain how the information could then be used to inform conservation measures/policy. In addition they need to discuss the constraints or obstacles that they may face in either implementing the studies, or the solutions the studies might suggest. This is to reinforce that science does not work in a vacuum and needs to work within the current economic, social and political atmosphere.**