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# Module 1: A Unique Species

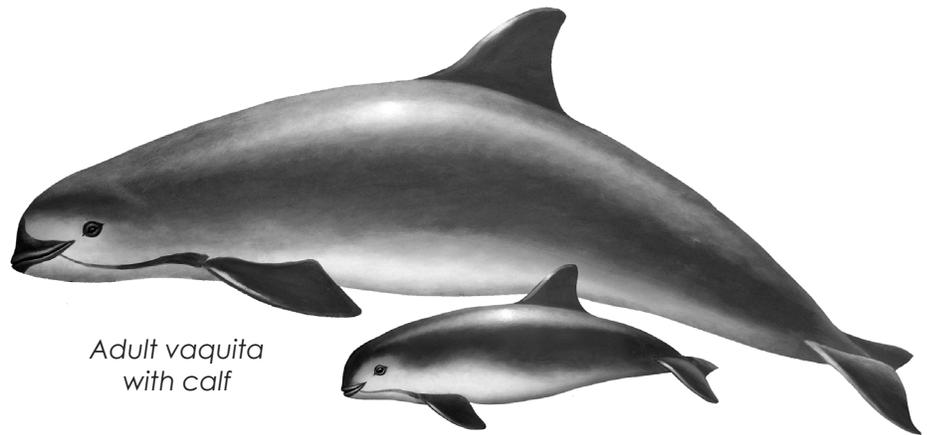
Save the Vaquita 9-12 Curriculum

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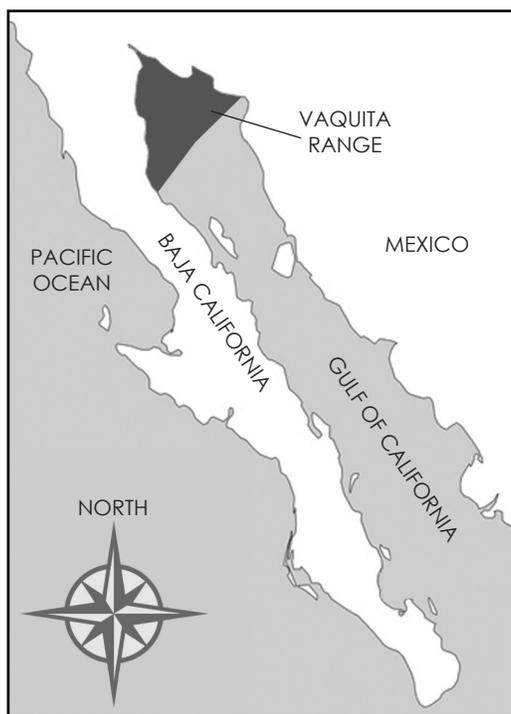
## Introduction:

The vaquita was not known to the scientific community until 1950, when a skull was found washed up on a beach in Mexico. The following year, two additional skulls were found and reported to be different from any known porpoise species. But it wasn't until 1958 when scientists were able to find a vaquita in the wild that the species *Phocoena sinus* – the "Porpoise of the Gulf" – was officially designated.



Adult vaquita  
with calf

In addition to being one of the world's smallest cetaceans, the vaquita is unusual in other ways. Its most striking feature is the dark ring around both its eyes and lips. Scientists are not sure what purpose those dark rings might serve. It has a very large dorsal fin for its size, both in height and width. This is believed to be an adaptation to the warm waters in which it lives, allowing it to shed excess heat from its body to the air.



## Vaquita range map:

The vaquita occupies a very limited range in the upper part of the Gulf of California between Baja California and the eastern part of Mexico. This strip of water is technically part of the Pacific Ocean, but the vaquita never leave this area.



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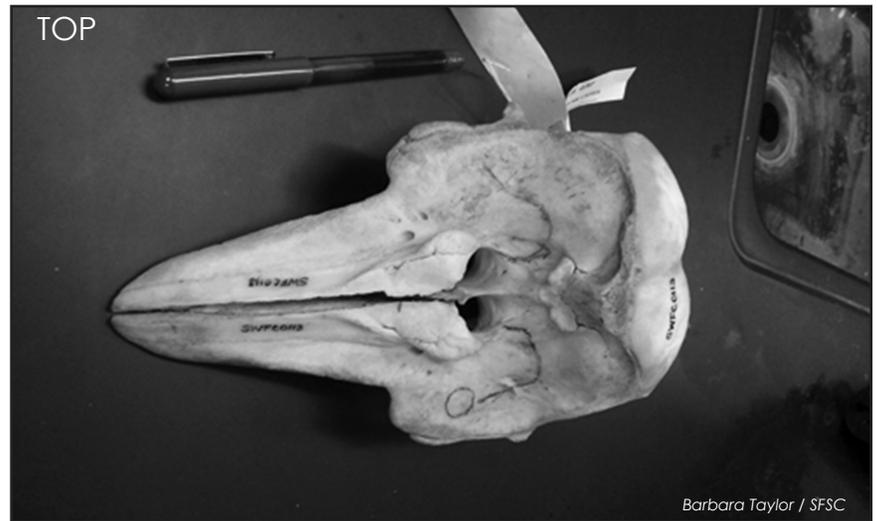
The vaquita also has the smallest geographical range of any known marine mammal. Almost the entire population lives in a 1,500 square mile (2,414 square km) area – an area less than one-quarter the size of Los Angeles! This patch of ocean is in the upper Gulf of California and is the only place in the world where vaquita are found.

Unlike dolphins, vaquita do not form large family groups known as pods, but tend to occur in small groups of 1-3 individuals, usually mothers and their calves. They rarely splash or leap out of the water, and tend to avoid boats. These behaviors make them very difficult for scientists to observe.

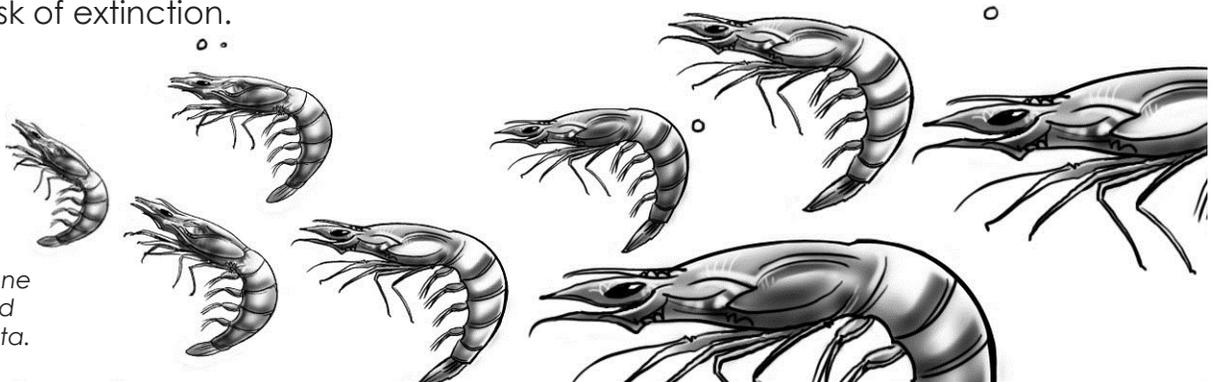
Unlike most other porpoise species which breed every year, vaquitas appear to give birth every 2 years.

The vaquita has been designated as “critically endangered” by the International Union for Conservation of Nature (IUCN). Without serious and immediate action, it is in risk of extinction.

## Vaquita skulls:



Blue shrimp are one of the main food sources for vaquita.

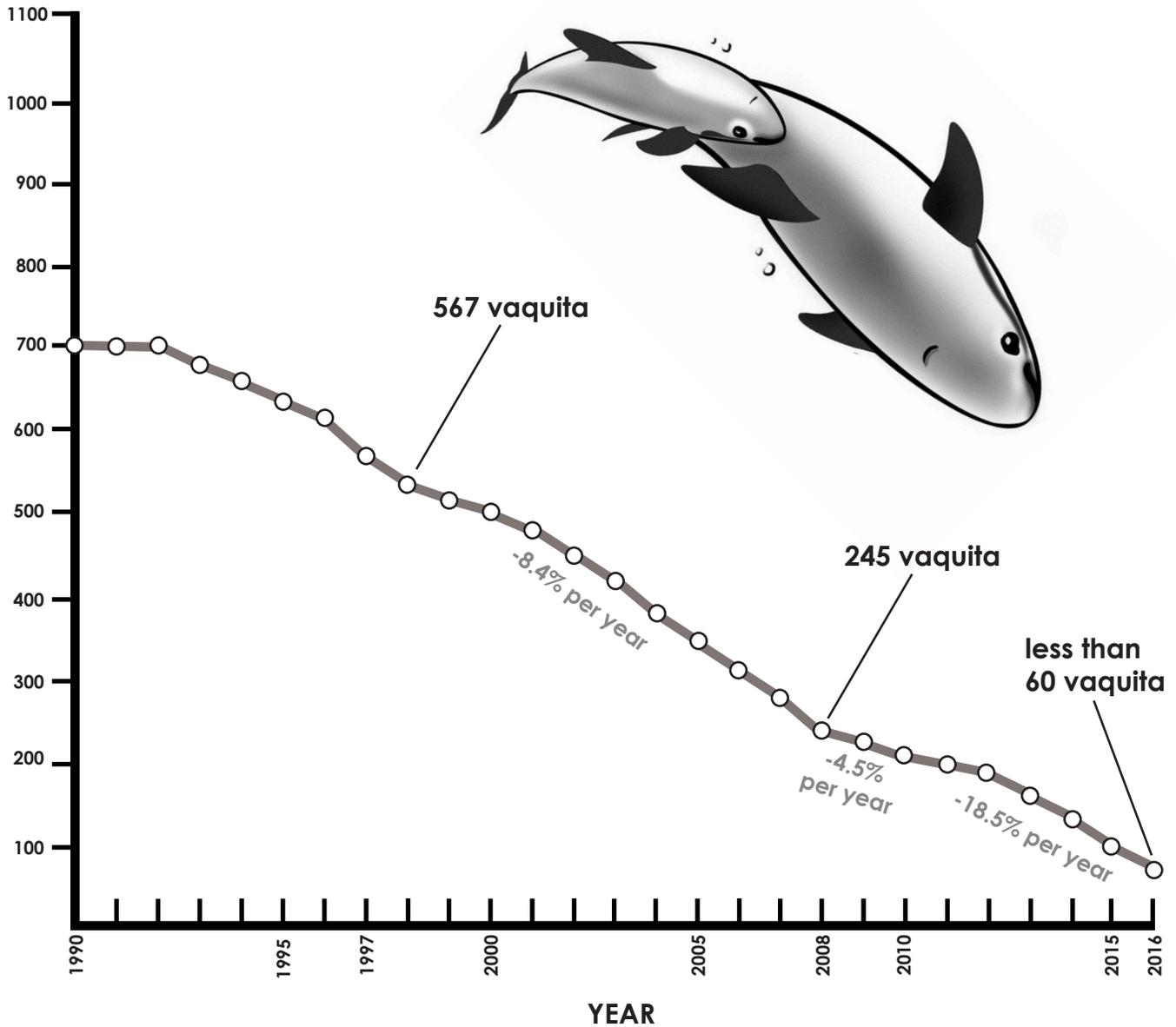


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## Vaquita population decline:



Adapted from data by Comité Internacional para la Recuperación de la Vaquita (CIRVA) V and VII

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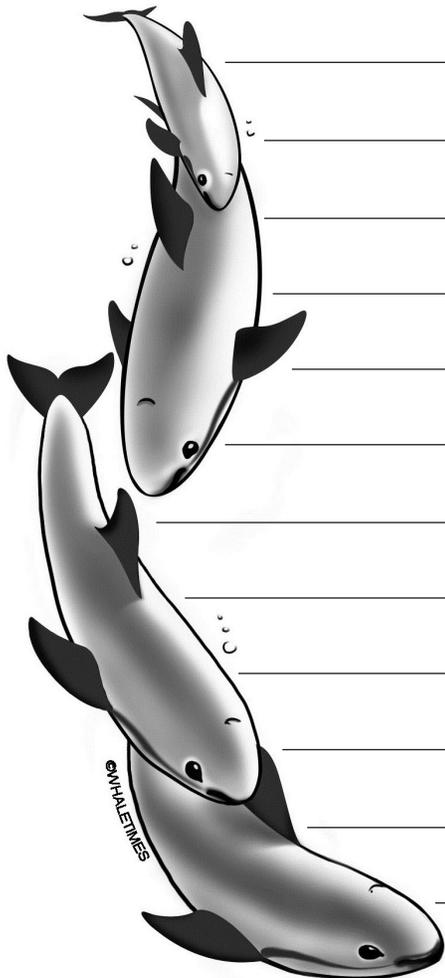
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## Student Exercise: Built-in Challenges?

There are many ecological and human factors contributing to the vaquita's decline, which you will learn about in additional modules. But some argue that certain aspects of the vaquita's adaptations and lifestyle have contributed to its endangerment as well.

Carefully read the background information about the vaquita, noting its history, lifestyle, and characteristics. Then, using evidence from the text, describe how one or more of these factors could make the vaquita more likely to become endangered or extinct.



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## Teacher's Assessment Guide for "Built-in Challenges?"

A proficient response will cite evidence directly from the text and make connections between the content of the text and related knowledge. Sensible logic and critical thinking should be employed to make their argument. The emphasis should be on how and why the vaquita's characteristics could make it vulnerable rather than merely re-stating the information provided. Answers should not cite information outside of the text unless they include a reliable source.

### Examples of acceptable explanations:

- The scientific community has not known about the vaquita for very long, so scientists have not had much time to gather important information about this species which could help direct them to solutions for saving it.
- Since their behaviors make them hard to observe, it is difficult for scientists to keep track of their current population and understand just how much they have declined. The small size might also make it harder for scientists to spot them in the ocean.
- Its range is limited to a very small area. If that particular area becomes polluted or negatively impacted in some way, there is nowhere else for the vaquita to go. Also, there are no other vaquita populations to ensure that the species survives.
- Unlike dolphins, these porpoises do not form large pods. This may make it more difficult for them to hunt large schools of fish.
- Their low birth rate means it is much more difficult for their population to recover from declines compared to other porpoises.

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## Alignment to Standards:

### Next Generation Science Standards

#### *Performance Expectations*

*HS-LS2-8.* Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.

*HS-LS4-4.* Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

#### *Science & Engineering Practices*

Constructing explanations

Engaging in argument from evidence

#### *Cross-cutting concepts*

*Cause and Effect:* empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

*Structure and function:* the way in which an object or living thing is shaped and its substructure determine many of its properties and functions.

#### *Disciplinary Core Ideas*

*LS2.D:* Social interactions and group behavior

*LS4.C:* Adaptation

#### *Connections to Nature of Science*

Scientific argumentation is a mode of logical discourse used to clarify the strength of relationships between ideas and evidence that may result in revision of an explanation.

Scientific knowledge is based on the assumption that natural laws operate today as they did in the past and will continue to do so in the future.

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## Common Core Alignment

English Language Arts standards for Literacy in Science and Technical Subjects, Grades 9-12

9-10.1: Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

9-10.8: Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.

11-12.7: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## Ocean Literacy Alignment

Principle 5: The ocean supports a great diversity of life and ecosystems.

d. Ocean biology provides many unique examples of life cycles, adaptations, and important relationships among organisms.

Principle 7: The ocean is largely unexplored.

b. New technologies, sensors and tools are expanding our ability to explore the ocean.