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Response: Commentary: Stable isotopes of carbon ($\delta^{13}\text{C}$) and oxygen ($\delta^{18}\text{O}$) from vaquita (*Phocoena sinus*) bones as indicators of habitat use in the Upper Gulf of California

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A Commentary on

Commentary: Stable isotopes of carbon ($\delta^{13}\text{C}$) and oxygen ($\delta^{18}\text{O}$) from vaquita (*Phocoena sinus*) bones as indicators of habitat use in the Upper Gulf of California

by Flessa KW and Dettman DL (2025). *Front. Conserv. Sci.* 6:1564652.
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Flessa and Dettman's (2025) comments in their article “Commentary: Stable isotopes of carbon ($\delta^{13}\text{C}$) and oxygen ($\delta^{18}\text{O}$) from vaquita (*Phocoena sinus*) bones as indicators of habitat use in the Upper Gulf of California” appear disproportionate and seem intended to divert attention from the main focus of the article. They criticize a sentence unrelated to the article's main contributions, using a magnifying lens and terms such as “improves the scientific rigor” and “erroneous and misleading.” The authors believe that, in order to contribute constructively to scientific discourse, a reasoned argument could have been presented without derogatory qualifiers that risk discrediting the article.

The article “Stable isotopes of carbon ($\delta^{13}\text{C}$) and oxygen ($\delta^{18}\text{O}$) from vaquita (*Phocoena sinus*) bones as indicators of habitat use in the Upper Gulf of California” (Rodríguez-Pérez et al., 2024) documents, for the first time, a shift in the vaquita's food sources, likely related to

changes in Colorado River flow. It points out that changes in the food chain likely stemmed from variations in primary productivity, which impacted vaquita feeding patterns, as suggested mainly by the carbon isotope. The article also notes that, in the case of oxygen, no differences were found between the two temporal groups, which correspond to the largest episode of water input from the Colorado River (1984–1988) and a period of zero freshwater input (1989–1993).

Flessa and Dettman (2025) criticized the following sentence from the discussion section:

“This enrichment in clams and fish has been related to a population decline in species such as *Mulinia coloradoensis*, *Cynoscion othonopterus*, and *Totoaba macdonaldi*, and has been attributed to high temperatures due to environmental change caused by the blocking of the Colorado River’s flow toward the UGC (Rodríguez et al., 2001; Dettman et al., 2004; Rowell et al., 2005, 2008).”

They base their commentary on two main points:

1. Flessa and Dettman (2025) indicate that although reported a decline in the population of the bivalve mollusk *Mulinia californiensis*, they did not document changes in the population sizes of the sciaenid fish *Cynoscion othonopterus* and *Totoaba macdonaldi*.
2. The authors highlight that they did not attribute the change in $\delta^{18}\text{O}$ values to higher temperatures, but rather to change resulted from a decrease in the Colorado River influx and the consequent increase in salinity in the delta region of the UGC.

In response:

The authors agree that the statement of attributing the change in $\delta^{18}\text{O}$ values to higher temperatures or to population decline is not directly supported by the references given in the original article. However, the authors remain supportive of the original statement that the study species was likely affected by drastic changes in their ecological niches due to altered environmental conditions in the Upper Gulf of California. In this context, the comment by Flessa and Dettman clarifies that temperature was likely not responsible for changes in vaquita $\delta^{18}\text{O}$ values but does not contradict the theory that was presented in Rodríguez-Pérez et al. (2024) regarding the influence of river flow changes on vaquita. The role of river flow remains central to the original article and was not discredited by the commentary of Flessa and Dettman.

Although we consider Flessa and Dettman’s (2025) comments disproportionate to the weight of the sentences mentioned above and the article’s main objective, the authors propose the following edition.

“The enrichment in species such as *Mulinia coloradoensis* (Rodríguez et al., 2001), *Cynoscion othonopterus* (Rowell et al., 2005), and *Totoaba macdonaldi* (Rowell et al., 2008) has been

related to environmental changes caused by the blocking of the Colorado River’s flow toward the UGC.”

Rodríguez-Pérez et al. (2024) believe these arguments must be published to prevent confusion among readers interested in the vaquita, the Upper Gulf of California, and isotopic methodologies.

Author contributions

M-YR-P: Writing – review & editing, Methodology, Supervision, Writing – original draft, Software, Conceptualization, Investigation, Visualization, Funding acquisition, Validation, Formal Analysis. LS-V: Project administration, Supervision, Writing – review & editing, Validation, Writing – original draft, Formal Analysis, Resources, Conceptualization, Funding acquisition. M-PR-H: Writing – review & editing, Software. CH-C: Writing – review & editing, Methodology. J-PG-R: Data curation, Writing – review & editing, Resources. FC: Writing – review & editing, Data curation. FA-S: Project administration, Supervision, Funding acquisition, Resources, Writing – review & editing. VG: Writing – review & editing, Software.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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