Evaluating the Effectiveness of Escape Vents in the Black Sea Bass (*Centropristis striata*) Trap Fishery



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Coastal Virginia Offshore Wind

Background

This study, in association with the Dominion Coastal Virginia Offshore Wind (CVOW) pre-construction surveys, aimed to quantify the effectiveness and size selectivity of escape vents in black sea bass traps. The CVOW lease area is located 27 to 42 miles off the coast of Virginia Beach, VA (Figures 1 & 2). The lease area will occupy approximately 112,800 acres with 176 turbines, associated substations, and cabling (Dominion Energy, 2025). Through initial investigations and outreach efforts, the black sea bass was considered an important species that supports fisheries conducted in and around the lease area. Due to this spatial overlap, research projects were designed to assess and monitor the impacts of offshore wind development on this fishery.



<u>Results</u>

Total Deployment & Catch:

- 790 traps (397 vented & 393 nonvented)
- Nonvented traps caught a significantly higher number of black sea bass (1,223) when compared to vented traps (544) (p < 0.01)
- Mean TL in vented traps (279.1 mm) was significantly higher (p < 0.01) than in nonvented traps (249.4 mm) (Figure 6)



Figure 1. Map of CVOW lease area relative to the Chesapeake Bay and Coastal Virginia.

Figure 2. Test turbines in the CVOW lease area.

Black Sea Bass Fishery:

- Spans the Atlantic coast from Maine to Florida
 - Managed under two stocks: Mid-Atlantic and South-Atlantic
- Large-scale recreational and commercial fisheries
 - Hook and line, bottom trawls, long-line, and traps
- Trap fishery often results in bycatch, including sublegal black sea bass (<11" minimum landing TL)
- Mandatory use of escape vents aims to reduce bycatch and discard mortality



Figure 3. Image inside the parlor of a black sea bass trap

<u>Figure 6.</u> Length frequency plot of black sea bass in vented (Red) and nonvented (Blue) traps. Dashed lines represent mean TL values and the 11"minimum landing TL.

Escape Vent Effectiveness:

- Vented traps reduced sublegal black sea bass catch by 26% (270 vs. 932 in nonvented traps) (p < 0.01) (Figure 7)
- No significant reduction in legal black sea bass catch (vented: 274, nonvented: 291) (p = 0.4)
- No significant difference in bycatch between vented (184) and nonvented traps (253) (p = 0.3)



<u>Figure 7.</u> Bar graph of total catch between vented and nonvented traps. Categorized by bycatch, legal black sea bass, and sublegal black sea bass.

Probability of Retention:

Legal black sea bass had a significantly higher probability of retention in vented traps (0.49) when compared to sublegal black sea bass (0.25) (p

(Credit: Will Burify).

Methods

Survey Details:

- 16 monthly deployments from June 2023 to February 2025 (Figure 4)
- 8 strings of 6 traps deployed (3 vented & 3 nonvented)
 - Vented traps had 2 sets of 2, 6.35 cm circle escape vents (Figure 5)
- 48-hour soak-time

Data Collection:

- Catch was counted for each trap & all black sea bass were measured (TL in mm)
- Up to 9 black sea bass per string were randomly selected for future analyses

Statistical Analysis:

- The selfisher package in R was used for probability of retention
 - *Probability of Retention*: Number of black sea bass caught in vented traps in relation to the total number of black sea bass caught
- Wilcox nonparametric t-test was run to compare differences in mean catch and probability of retention.





<0.01) (Figure 8)



Figure 8. Probability of retention for Vented traps estimated with the selfisher method.

Conclusion

- Escape vents effectively reduce sublegal black sea bass catch while retaining legal catch
- Legal black sea bass have a higher probability of retention in vented traps when compared to sub-legal black sea bass
- Escape vents for important for fisheries management purposes by reducing discard mortality, thus increasing the potential yield per recruit
- Beneficial for commercial fisherman by reducing sorting time and improving catch efficiency
- CVOW post-construction surveys will follow the same protocol to assess











<u>References</u>

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