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Lined Seahorse Distribution, Abundance, and Habitat Preferences from the VIMS Trawl Survey 1979-2000

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from the VIMS Trawl Survey 1979-2000**

Presented to
Virginia Nature Conservancy

Prepared by
Patrick J. Geer
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Virginia Marine Resource Report
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History

- Trawl Survey has been conducted since 1955.
- Since 1988, sampling has been relatively constant, with additions to areas of special interest.
- Approximately 130 stations per month with a 30ft otter trawl (~ 1400 sites annually)

Estimates of Abundance

- Typically estimates of abundance are calculated by selected the temporal and spatial components of peak abundance. This greatly reduces variance since areas and times which a species would not be found are removed from consideration. Values are usually presented as a weighted geometric mean per trawl.
- In the present circumstance all data were considered to produce an overall monthly and annual estimates (1988 - 2000).

Findings

- Lined seahorses are typically caught by the VIMS trawl survey during the months of May to November, with catches greatest in August to November (Figure 1).
- Distributional data suggests a home range with even distribution inside the bottom portion of the Chesapeake Bay extending up the Eastern side of the Bay, and into the lower reaches of the James and York Rivers (Figure 2)
- Concentrations are highest in the lower two portions of the mainstem Bay (B1 and B2) Figure 3.
- Hydrographic data suggests a preference to waters greater than 10° C, salinities above 16 ppt, and depths between 6 and 12 m. (Figure 4).
- Prior to 1988, sampling of the mainstem Bay was sporadic, and very few seahorses were captured by the survey, as is evident by the occurrence rate (Figure 5). This rate has

averaged just over 5% since 1988, 0.72% in earlier years (1955-87).

- Since 1988 seahorse abundance has been variable with three distinct modes (1988-90, 1991-93, 1994-98). There was a significant decline in catch between 1997 and 1998-99. However, catch recovered slightly in 2000 (Figure 6). The variability of these results would suggest no significant decline in abundance during this 13 year period.
- A more detailed examination can be performed if found to be necessary. This would include subsetting annual samples to select the temporal and spatial components which best represent distribution of the species, examining the relationship between catch and abiotic parameters, and examine habitat usage.

Lined Seahorse Mean Catch by Month 1988-2000

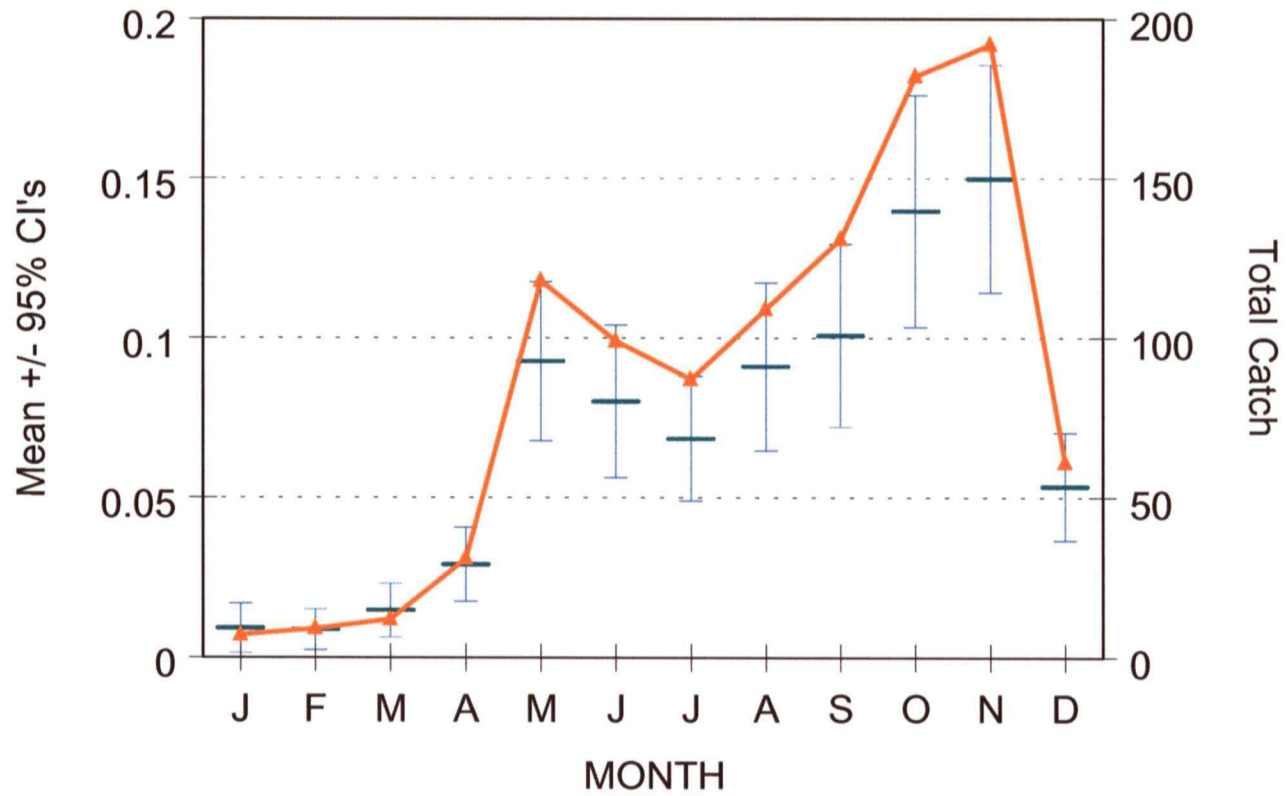


Figure 1. Mean catch per month with the 95% confidence intervals from 1988-2000.

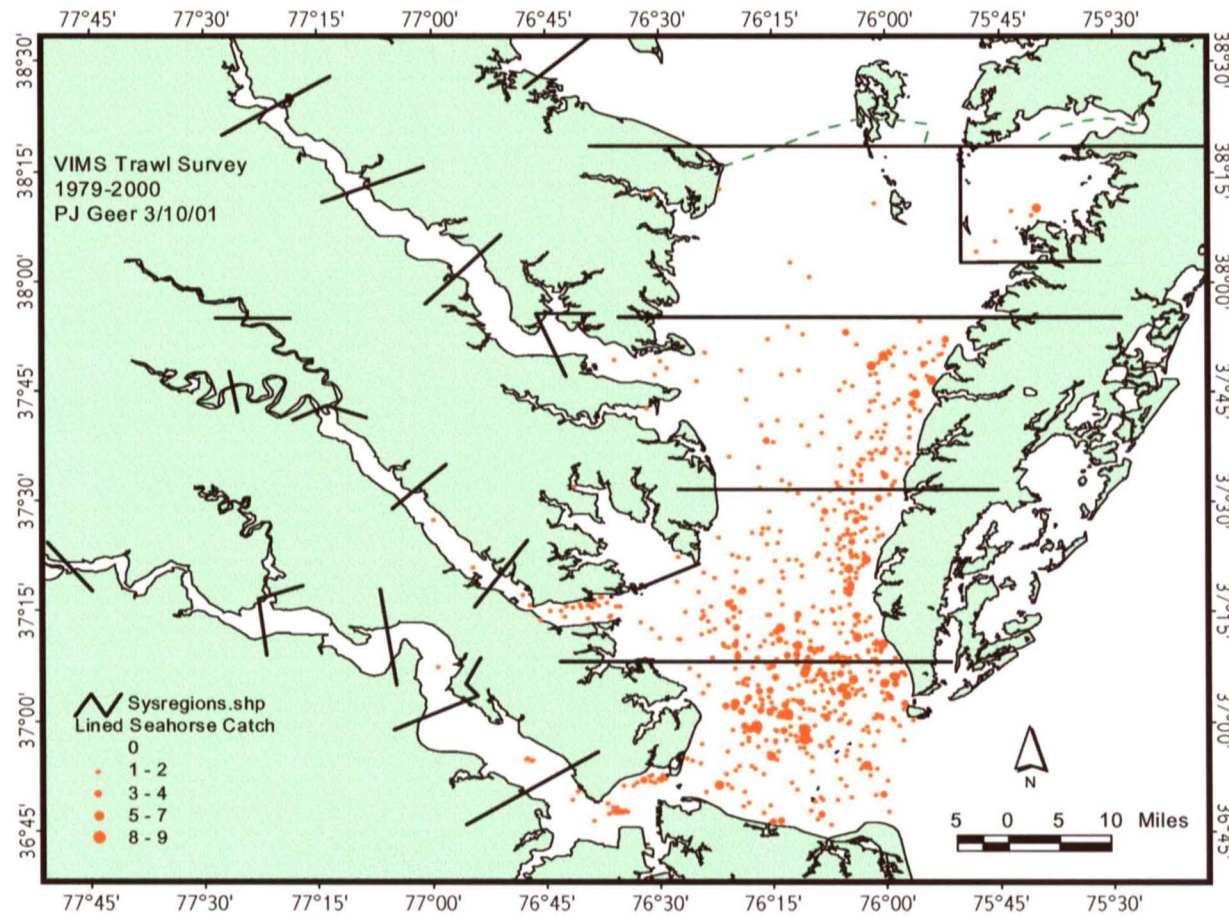


Figure 2. Lined seahorse catches from 1979 to 2000.

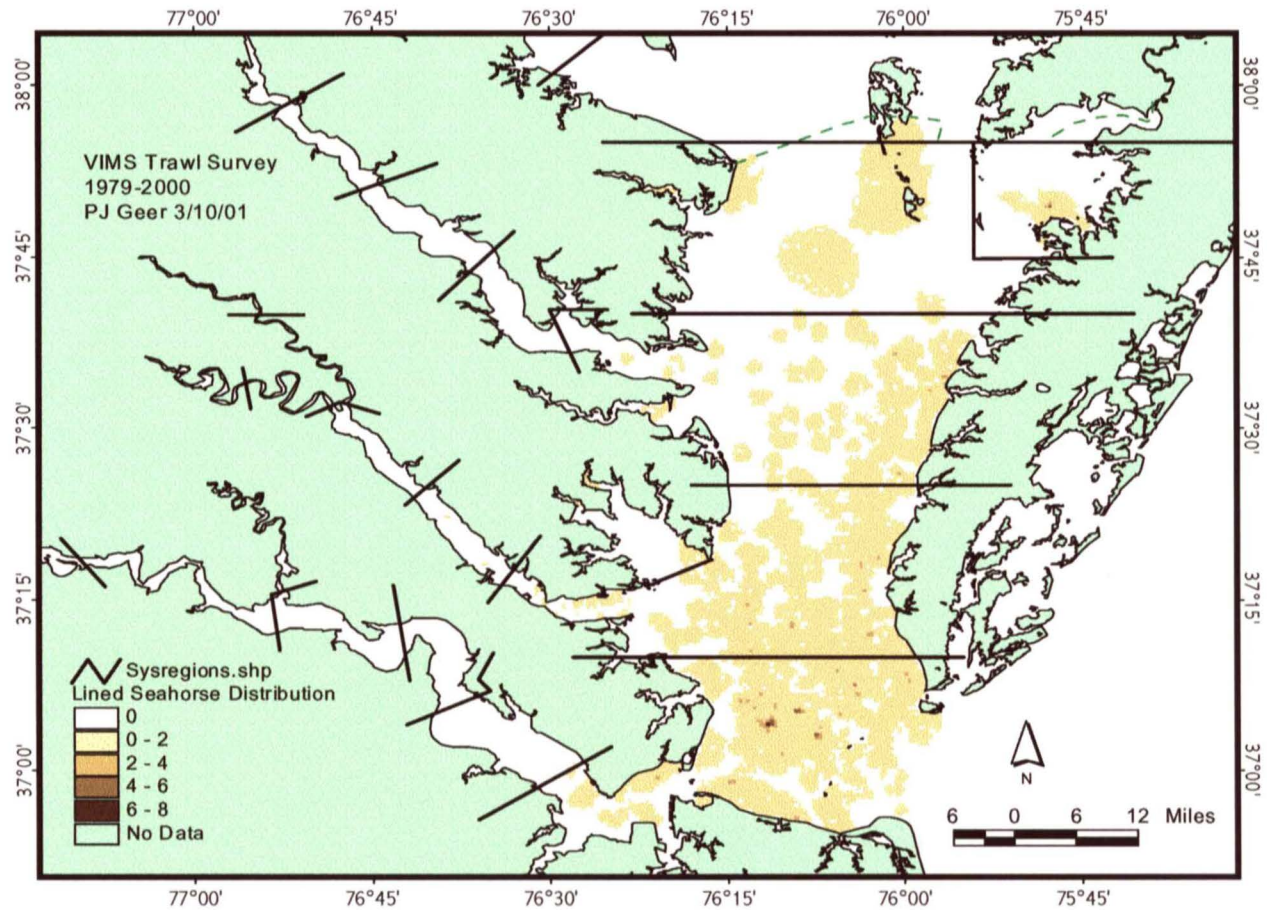


Figure 3. Density of lined seahorses captured by VIMS Trawl Survey, 1979-2000. Notice the highest densities are in the lower Bay.

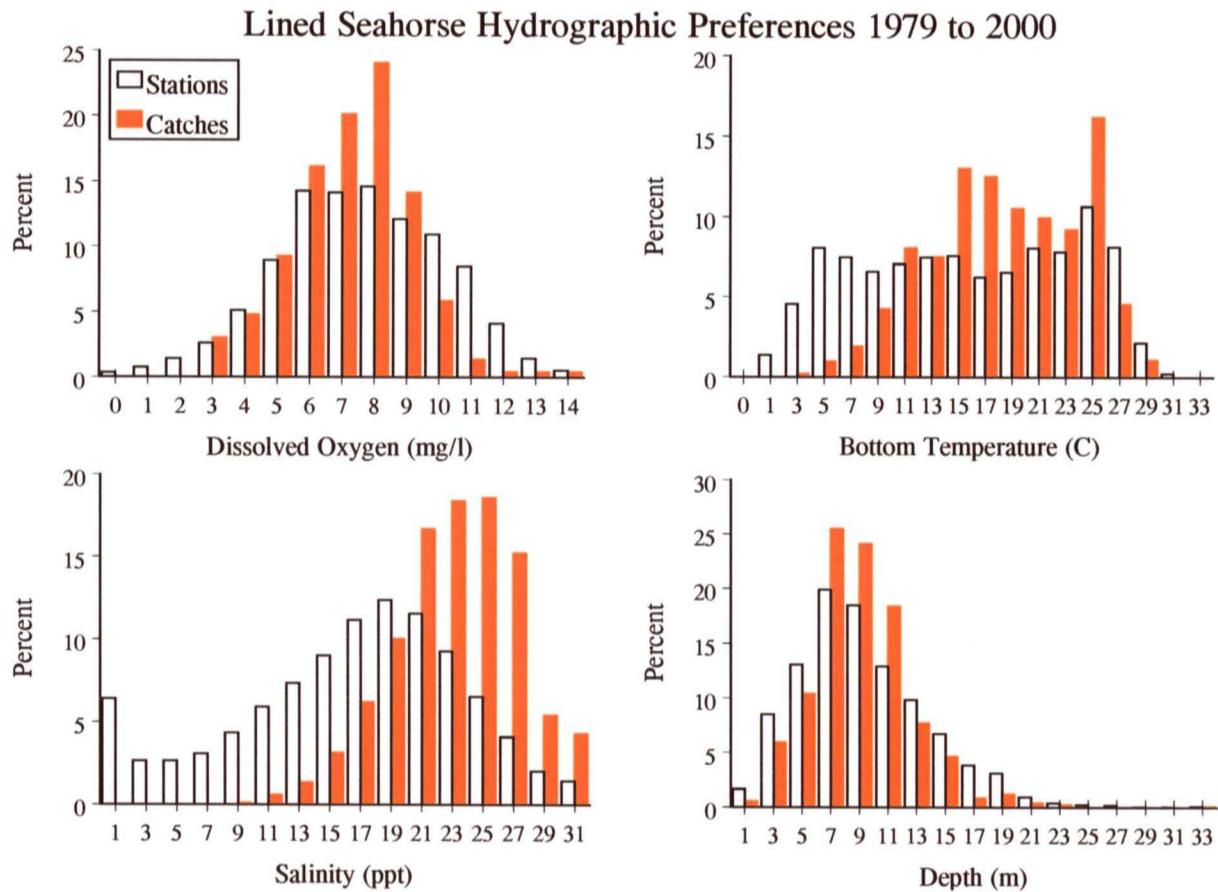


Figure 4. Hydrographic preferences from the VIMS Trawl Survey, 1979-2000. White bars indicate the percent of stations at that interval, red the percent of catch. A disparity between the two suggests a preference.

Occurrence Rate Of Lined Seahorses from VIMS Trawl Survey

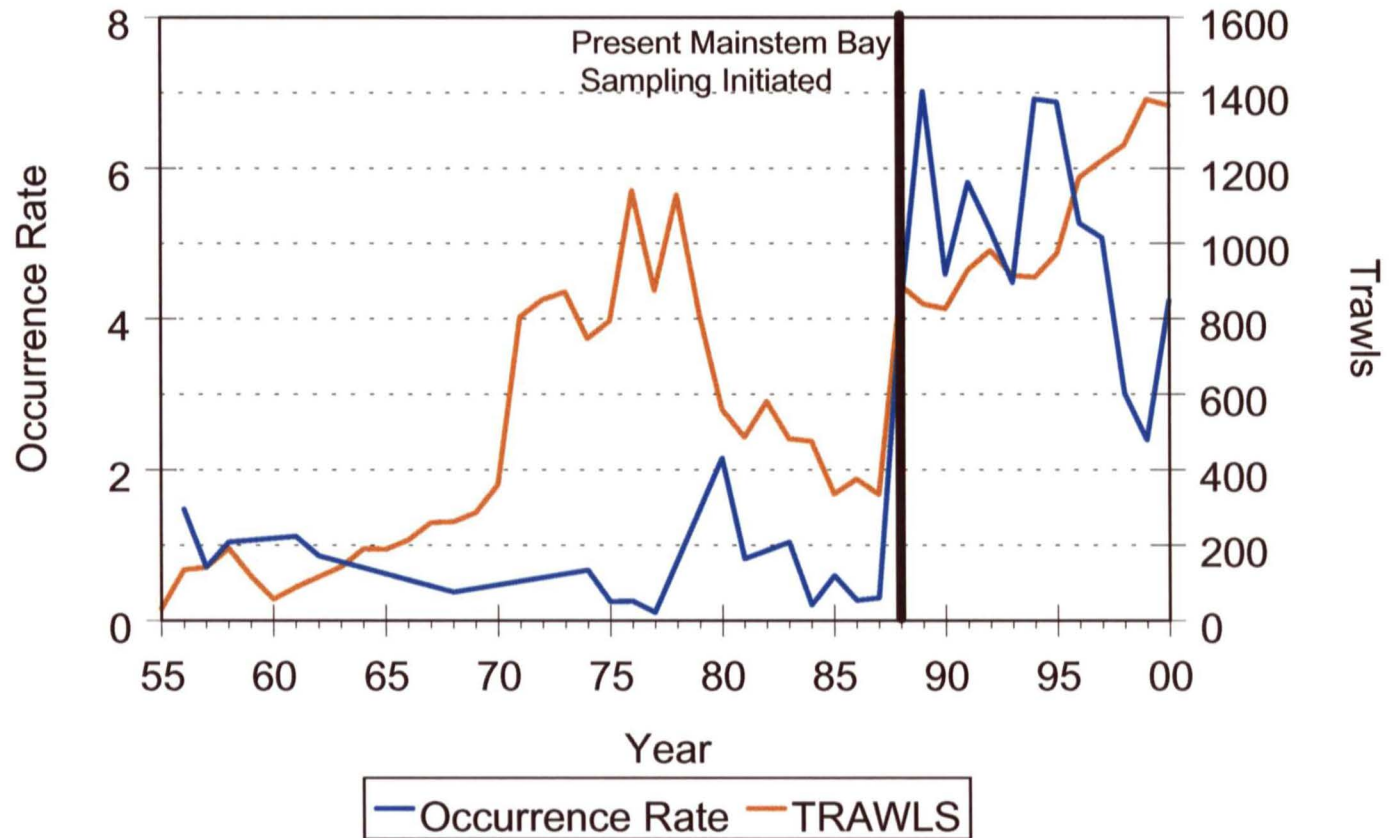


Figure 5. Frequency of occurrence from the VIMS Trawl Survey, 1955-2000. Note the main-stem Bay Was not consistently sampled on a monthly basis until 1988.

Lined Seahorse Mean Catch by Year 1988-2000

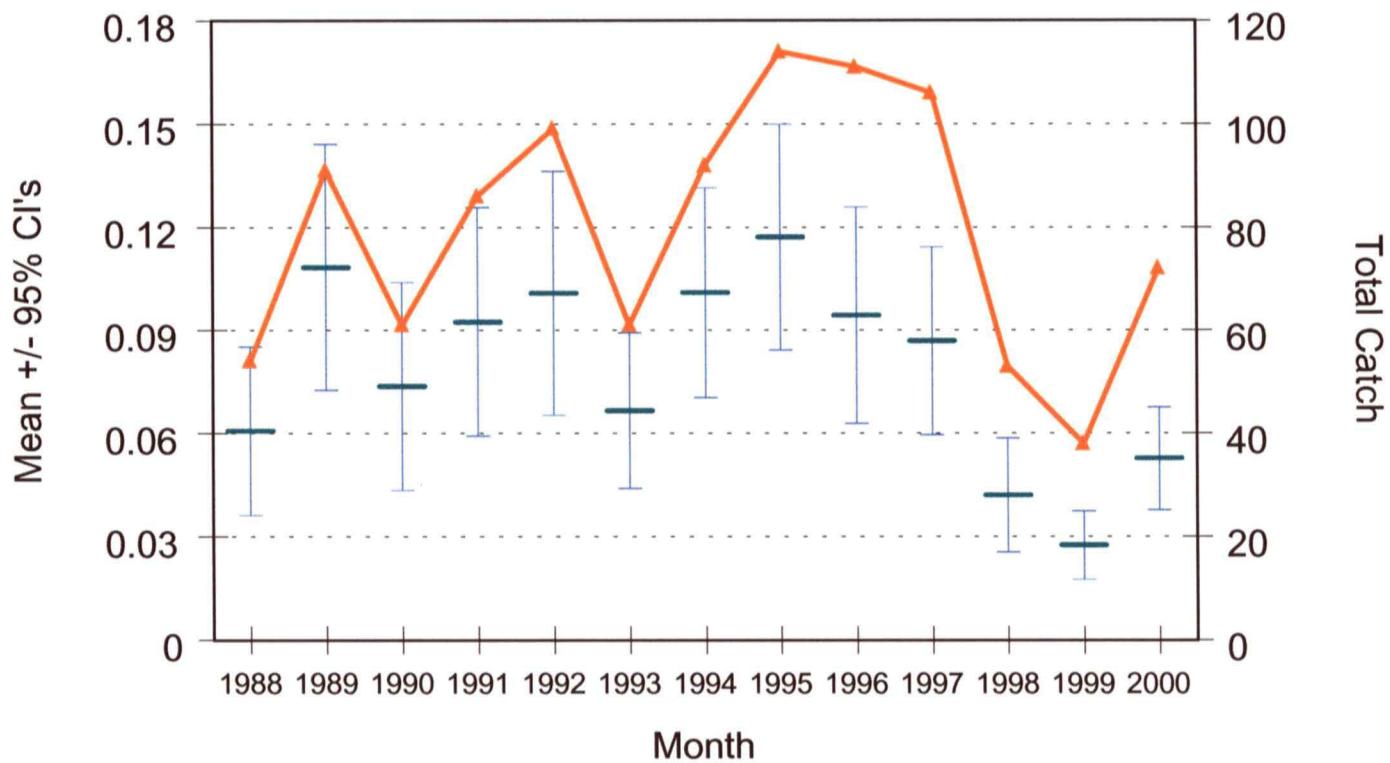


Figure 6. Arithmetic mean per trawl (1988-2000) with associated 95% confidence intervals. Estimates can be further refined by selecting only the temporal and spatial components of peak abundance, (October - November in the lower Bay).